

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Hungry for speed

**Gigabit Ethernet
start-ups are off
to a fast start.**

By Jodi Cohen

Las Vegas

And so we met again. Six months after hosting CEOs from five Gigabit Ethernet start-ups for dinner in Silicon Valley to discuss the state of the market, *Network World* recently reconvened the Gigabit gang for an industry update.

See Gigabit, page 64



NT at risk of hack attacks

Microsoft releases NT service pack to plug holes, but network security experts warn that many openings remain.

By Ellen Messmer
and Christine Burns

Microsoft Corp. last week released a service pack aimed at plugging major security holes in Windows NT 4.0, including one called the Out-of-Band attack that can crash a system.

But is the latest fix enough? Not quite. There remains a laundry list of issues Microsoft must address before security gurus will consider NT a safe system.

Microsoft, however, is undeterred. Tomorrow, the company will host a Scalability Day in New York to show how well NT plays in the enterprise.

One of the biggest problems

Microsoft still needs to overcome is that NT 4.0 password protection relies on authentication technology that is widely known to be easily broken. Additionally, the cryptography used to con-

See NT, page 65

- Get more online:
- Copies of the latest Microsoft security patches
- Guides to securing NT servers
- A look at an earlier bug affecting the NT password file

NetworkWorld Fusion

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INTRA

Special supplement begins after page 35.

DIRECTORY
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- IBM's take on NCs
- Handbook: JavaScript

ILLUSTRATION BY RICH BORG

Notes to get 'Net refresh

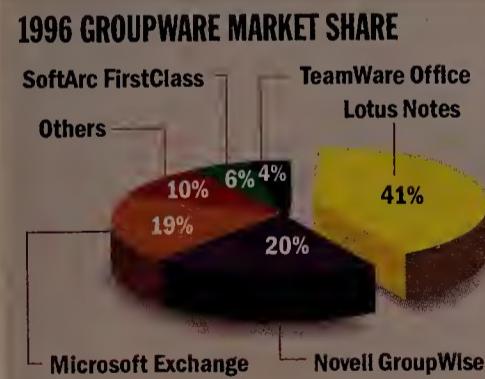
By Paul McNamara

In addition to delivering beefed up Internet support for its Notes client on schedule,

Lotus Development Corp. this week is expected to announce an earlier-than-promised performance boost to its Domino Web server, sources close to the company said.

The developments may advance Lotus' efforts to shake the "proprietary groupware" rap on venerable Notes, experts said. The company also may appease critics who have complained that Lotus' current darling, Domino, does not perform like a bona fide Web server.

See Notes, page 15



SOURCE: IDC, FRAMINGHAM, MASS.

NEWSPAPER \$5.00

TOO

Companies shell out hard cash for Web searches

By Todd Wallack

Call it Yahoo for Dummies. Or, perhaps more politely, Advanced AltaVista for people too busy to learn Boolean logic.

But whatever you call it, Fortune 500 companies are shelling out big bucks to hire outside firms to search the Internet — something any experienced Web surfer could do with ease.

Specifically, Datalytics, Inc. of Dayton, Ohio, is charging \$895 for an automated search of AltaVista, Lycos and other resources. And a Manhattan-based public relations firm is charging between \$10,000 and \$15,000 to let companies know what is being said about them online.

"Most companies do not have a clue," said Don Middleberg, who runs the New York-based public relations firm Middleberg Associates that has carved

out a profitable online search niche. In the past few months, Middleberg said he has been retained by some of the largest firms in entertainment, consulting and pharmaceuticals to surf the 'Net.

"Of course, these companies have people who are in their 20s and fully conversant online," Middleberg said. "But their superiors are not...they do not even know what questions to ask."

Middleberg said public relations professionals are good communicators but typically not technically savvy and shy away from asking the IS department or underlings for help. "We bridge the gap," Middleberg said.

After the initial "audit" — in which a team of researchers spends two weeks using search



Most companies are clueless about what is being said on the 'Net, Middleberg says.

See Search, page 65

Mobile³



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ATM FOR THE MASSES

Hypercom's Paul Wallner says the time is right for low-speed ATM. Page 23.

MORE FROM FORE

FORE's Ethernet-to-ATM switch can now support 30 times as many net devices. Page 17.



BUG SCREEN

Eric Chu continues to scrape the bug buildup off JavaSoft's JDK. Page 8.

FIND IT FUSION

To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.

9 9 9 9

This Week

Only on Fusion

- **Groupware.** A top Lotus executive discusses Notes' evolution from a proprietary groupware application to a more open Internet-based workflow system. **DocFinder: 2035**
- **Network computers.** A Corel spin-off hopes to ship a video-enabled network computer for the desktop this fall, followed quickly by a smaller, mobile version. **DocFinder: 2036**
- **Security.** The government last week indicated it could drop a rule requiring federal agencies to buy only products that use the government-sponsored Digital Signature Standard. **DocFinder: 2037**
- **Internet.** Netscape says it will develop a version of its FastTrack Web server for Be's BeOS. **DocFinder: 2038**
- **Help desk.** UniPress Software last week announced a help desk application that lets customers seek help, find fixes and track problems through a Web interface. **DocFinder: 2039**

From the front page

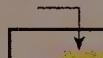
- They came, they ate, they discussed Gigabit Ethernet. See what a group of industry pioneers had to say the first time we took them to dinner last fall. **DocFinder: 2031**

Buyer's Guide

- Read our review of videoconferencing software (page 41). Then, go online for an interactive buyer's guide that lets you search for the software that meets your criteria. **DocFinder: 2021**

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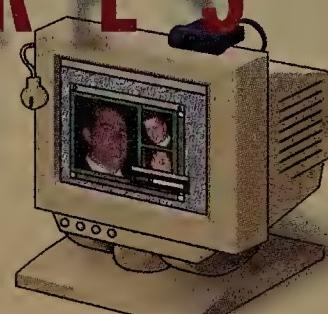
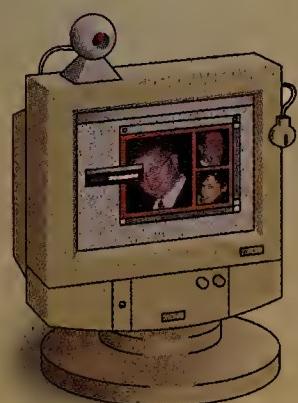
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Desktop video is coming of age. Page 44.

Complete product chart. Page 46.

News briefs, May 19, 1997

More information, please

The U.S. Department of Justice's Antitrust Division has requested more information on Ascend Communications, Inc.'s \$3.7 billion planned acquisition of Cascade Communications Corp., Ascend officials announced last week. The request will extend the waiting period during which the Justice Department is allowed to review the deal under the Hart-Scott-Rodino Antitrust Improvements Act. Ascend announced plans to acquire Cascade in a stock swap deal nearly two months ago.

Intel to defend itself

Digital Equipment Corp. last week filed a lawsuit alleging that Intel Corp.'s Pentium, Pentium Pro and Pentium II microprocessors infringe on Digital's semiconductor technology patents. Digital Chairman Robert Palmer also said last week that Intel has not done a great deal of original microprocessor architecture research.

In a short statement released last week, Intel said it will defend itself "vigorously" against Digital's patent infringement claims.

Tandem, Microsoft show clustering muscle

Tandem Computers, Inc. and Microsoft Corp. last week demonstrated a cluster of 16 servers in what the companies claimed was the world's largest Windows NT server, delivering a 2-terabyte, 30-billion-row customer database. Designed as a customer support application for Dayton Hudson Corp.'s data warehouse, the system links 64 Pentium Pro processors using Tandem's ServerNet interconnect technology.

Tandem also said it is extending its NonStop clustering software to support Windows NT and Microsoft's entire BackOffice software family.

Informix on the block?

Informix Software, Inc.'s stock rose two consecutive days last week—from less than \$9 a share to more than \$11 a share—following rumors that the company might be acquired. Informix declined to comment on speculation, raised in a *San Francisco Chronicle* article, that it could be snapped up by Microsoft Corp., Netscape Communications Corp. or Computer Associates International, Inc. Informix's stock has taken a beating since April, when the company warned investors of its \$140 million first-quarter loss.

Netscape revs up another beta

Netscape Communications Corp. last week released the beta version of its Messaging Server 3.0 for Windows NT. The software features Lightweight Directory Access Protocol support.

Bay follows through

Bay Networks, Inc. next week will unveil the first products under its Adaptive Networking banner. Bay will roll out a token-ring workgroup switch that is designed to compete against similar offerings from 3Com Corp. and IBM; and higher density token-ring switching modules for Bay's Centillion 100 backbone/wiring closet switch. Each token-ring module for the Centillion 100 currently sports four ports.

At press time, pricing could not be determined, but the products are expected to ship later this quarter.

Visa, MasterCard charge ahead on security

Visa International, Inc. and MasterCard International, Inc. last week said they have selected CertCo LLC, a Bankers Trust Co. spin-off, to provide root encryption management for the digital certificates Visa and MasterCard intend to offer cardholders to make using credit cards over the Internet safer.

The security technology is based on the Secure Electronic Transaction standard.



IBM middleware to link client apps with back-end transaction systems

By John Cox

St. Louis

IBM's new component broker connector is drawing praise from users and analysts as a quick way to marry software components on PCs with legacy applications.

The CBConnector and its companion, CBToolkit, were announced last week here at IBM Technical Interchange '97.

The offerings are designed to enable developers to write middleware applications capable of capturing transactions from back-end systems such as databases or CICS. CBConnector can then turn the transactions into component software and combine the components with existing ones or create new distributed applications for the Internet, extranets or corporate intranets.

Today, corporate developers face months of work trying to blend client applications with back-end systems. CBConnector replaces all the customary hand coding with ready-to-use services and interfaces.

"The only piece you have to write is the business logic," said Patti Dock, IBM's director of object technology middleware. "You don't even have to know the CICS or DB2 programming interfaces."

The new software is based on the Common Object Request Broker Architecture, an industry standard for developing distributed objects. Client programs, written with common tools such as Visual Basic, simply call the CBConnector software, which then supplies services such as security or naming, as well as links to back-end systems.

Swiss Bank Corp. will start testing CBConnector in about a week. "We needed something like CBConnector because otherwise we'd have to buy separate pieces [of software] and glue them together ourselves," said Jens Hunker, a senior vice president at Swiss Bank.

Eventually, Hunker said, CBConnector will be the framework that Swiss Bank can use to build new server-based components that can be accessed by ActiveX and Java clients.

CBConnector generates C++, Java and ActiveX code that can be incorporated easily into client applications written with standard development tools such as

Visual Basic.

That is a critical capability, according to John Rymer, vice president with Giga Information Group, a Cambridge, Mass.-based technology consultancy. That is because CBConnector lets armies of existing programmers, without doing anything new, create and deploy client applications that

access CBConnector's server-based objects and services.

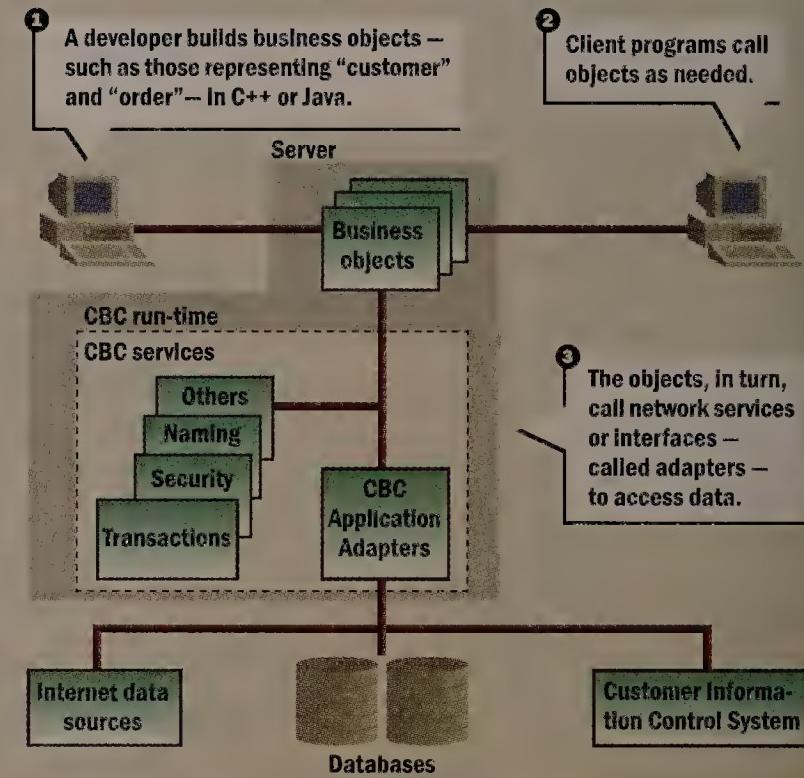
CBConnector enters beta-testing this month, with general delivery planned for next fall.

The beta release includes one adapter for DB2, but other adapters from IBM and third parties will support non-IBM databases and applications.

Pricing has not been set. ■

IBM's Component Broker Connector

CBConnector (CBC) is an infrastructure for building applications from components.



IBM moving OS/2 toward net computing

IBM's new Bluebird software is the company's first step toward extending OS/2 into the emerging market for networked thin clients.

Bluebird runs on the OS/2 Warp operating system and provides tools that promise to lower the cost of managing and maintaining enterprise PC environments.

"The purpose of Bluebird and OS/2 is to protect the existing customer investment in DOS, Windows 3.1 and OS/2 applications, and [at the same time] create a seamless evolution toward network computing for our customers," said John Albee, IBM's OS/2 Warp program manager.

Also in the network computing, thin-client vein, IBM officials said that in the next few weeks they expect to begin beta-testing a lite version of OS/2 Warp for network computers (NC). The software will comprise OS/2, Java and a browser, likely based on Netscape Communications Corp.'s technology.

This thin-client focus is consistent with IBM's moves for OS/2 during the past nine months, according to Albee. IBM's Network Computing Framework, announced last month, relies on OS/2 as the underlying server platform, he said.

As for Bluebird, its tools let managers set up and control the look and feel of the user desktop interface, including the data and applications users can access.

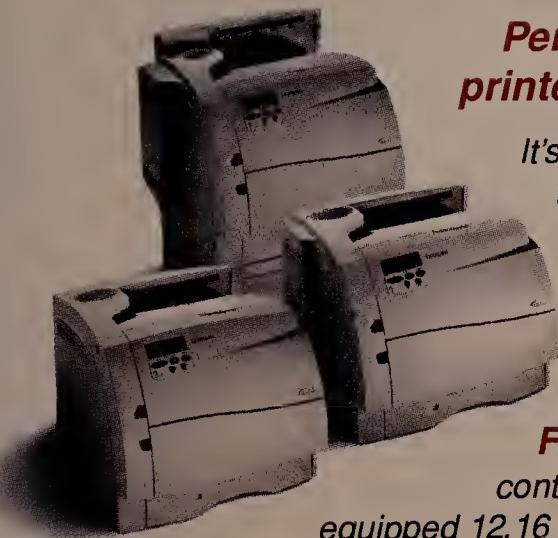
A Bluebird beta is available now.

—John Cox

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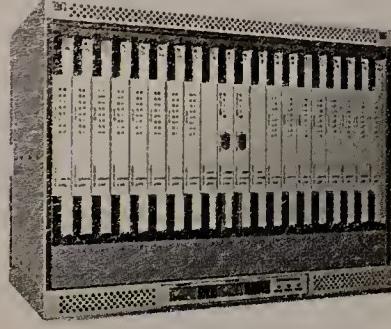
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DSL can toggle services

By Tim Greene

Digital subscriber line (DSL) vendors are coming up with ways for you to point and click your way from service to service over broadband connections.

Later this year, Sourcecom Corp. will deliver BANC 9000, a multiplexer supporting users that want high-bandwidth links to more than one destination,



such as the Internet and the corporate network.

With software the company said has been demonstrated in Asia, BANC 9000 will enable the customer PC to control which multiple permanent virtual circuits (PVC) are called up. Those PVCs would be provisioned by the carrier.

That gives DSL the flexibility users could find attractive. "Everybody's going to have to come up with a front end that lets you connect to lots of

places," said Bobbi Murphy, an analyst with Dataquest, Inc. in San Jose, Calif.

BANC 9000 supports rate-adaptive DSL that can continually adjust bandwidth based on the condition of the phone line.

DSL from Ariel

Ariel Corp. is introducing its line of asymmetric DSL (ADSL) gear that also supports separate PVCs based on ATM.

With Ariel's Horizon gear, users can call on as many as eight ATM PVCs. Because users would have to install ATM network interface cards in their PCs, a Horizon network would support ATM quality of service (QoS) levels.

That would offer the option of guaranteeing support for video traffic as well as handling less time-sensitive traffic with a lower QoS.

Ariel will show off its Horizon gear at the SuperComm '97 trade show next month in New Orleans.

BANC 9000 has not been priced yet and will be available in the third quarter.

Horizon products are shipping now. They are priced at \$995 per port for the carrier multiplexer and \$395 for the subscriber modem. ■

Java applications

JavaSoft squashes bugs in development kit

By Ellen Messmer
and Carol Sliwa

Mountain View, Calif.

This week, Sun Microsystems, Inc.'s JavaSoft unit is expected to release a JavaSoft "bug fix" that corrects graphics and security problems found in the Java Development Kit (JDK) 1.1.1.

JDK 1.1.2 will fix the new Java digital signature technology used for signing applets, which Princeton University researchers recently revealed as flawed.

The security vulnerability lets a signed Java applet sent by an attacker impersonate another signed applet by exploiting a weakness in the Java API.

The JDK bug fix will also make minor changes in the Java Virtual Machine and the Abstract Windowing Toolkit to improve their performance, ac-

cording to Eric Chu, JavaSoft product marketing manager.

For Java licensees such as Microsoft Corp., the stream of bug fixes has been vexing.

Microsoft program manager Charles Fitzgerald said the company has received six different versions of the JDK since February.

"The JDK 1.1.2 is mainly a bug fix release. But in all our software projects, we will continue to improve quality."

Eric Chu, product marketing manager, JavaSoft

"We're trying to lock down Internet Explorer 4.0, and we're going to incorporate JDK 1.1 functionality into that release. How do we lock that down if we get a new release every two weeks?" Fitzgerald asked.

"Some of us have quality control considerations in our prod-

Nets, Inc. bankruptcy ignites Manzi debate

Defenders laud CEO's character, critics fault business model.

By Chris Nerney

Cambridge, Mass.

Jim Manzi had a vision, one powerful enough to lure a group of Lotus Development Corp. executives to Industry.net, the Pittsburgh-based company he took over in January 1996.

But the financial community never bought into Manzi's plan to position his company as an Internet-based broker for buyers and sellers of heavy equipment for manufacturers.

Manzi's lack of success in attracting investment funding led his company, now called Nets, Inc., to file for Chapter 11 bankruptcy protection in a Massachusetts court on May 9.

One Pittsburgh-based analyst said Nets, Inc.'s demise was due more to a flawed strategy than any weakness in the business-to-business electronic commerce market.

"Their product vision was to create this business-to-business mall, but what they had was a glorified bulletin board," said Robert Grzyb, vice president of Fisher Technology Group.

uct release cycle," he said.

However, developers who are not Java licensees but do use the JDK tool kit to write programs appear to be taking the fixes in stride.

"Yes, there still are bugs in the JDK. The scrollbars are still broken on some platforms, such as Solaris," said Ted Young, presi-

dent of Advanced Web Technologies, Inc., a New York-based consultancy specializing in Java software development. But Young said he did not expect the bug fix to result in changes to existing APIs.

After the bug fix, JavaSoft's next big step will be releasing a first-cut beta of the Java Foundation Classes (JFC) in mid-June.

By the end of the summer, JavaSoft hopes to combine the polished JFC with JDK 1.1.2, calling it JDK 1.2. ■

"They ignored the value-add of distributors to buyers."

Neither Manzi nor former US WEST, Inc. executive Catherine Hapka, who Manzi hired in March as president of Nets, Inc., have granted interviews since the bankruptcy filing.

However, critics and defenders of Manzi have had plenty to say in recent days, though only one individual was willing to be quoted by name.

They paint two distinct portraits of Manzi. Several people who worked with him when he headed Lotus' Notes project, laud Manzi's intelligence, character and ability to inspire.

"I always thought he was a brilliant guy who had an amazing talent for challenging people to really think deeply about a business," said a former Lotus executive who now runs his own start-up. "I learned a lot from him."

Others — primarily venture capitalists — accuse Manzi of being unduly arrogant, a poor



Nets, Inc.'s Manzi

manager and harboring a distorted view of Nets, Inc.'s worth.

"He's very bad on his people skills and building a culture that allows a company to be successful," said one Boston-area venture capitalist.

Ultimately, of course, it was the cash shortage that forced Nets, Inc. to seek court protection from creditors. In an internal memo announcing the bankruptcy filing and layoff of all but a handful of Nets, Inc.'s 200 employees, Manzi cited a poor investment climate as a reason for the company's difficulties in raising funds.

But another Boston-based venture capitalist said Manzi "never had his head on straight about the valuation of the company."

Manzi and other Nets, Inc. officials are now considering reorganization options under Chapter 11. The company reportedly is discussing a deal to sell its assets or merge operations with Cahners Publishing Co. of Newton, Mass.

While most industry observers interviewed think talk of a revived Nets, Inc. is unrealistic, at least one venture capitalist said rumors of the company's demise may be premature. "I think the idea was a good one, but it was slightly ahead of its time," said Todd Dages of Battery Ventures in Boston. ■

Microsoft promises to let you build an intranet in an hour

By Carol Sliwa

Redmond, Wash.

Microsoft Corp. today will make available an Office 60-Minute Intranet Kit aimed at helping small departments within companies build their own intranets.

The new kit includes "ready-to-go intranet starter" templates that can be used to create a Web site. The templates can be tailored for the creation of Web sites in four areas: sales and marketing, finance, human resources and product development.

The kit also features a Web FindFast search and indexing tool, a step-by-step guide for building the intranet and other training materials.

The kit can be downloaded for free from Microsoft's Web site (www.microsoft.com/office/intranet) or obtained in

CD form for the cost of shipping.

Although the intranet kit is free, in order to make use of it one of the departmental users needs to be running Microsoft's FrontPage Web authoring and site management tool.

FrontPage costs \$149 and comes bundled with a personal Web server. Other members of the department need to use Microsoft Office or at least have access to one or more of its components.

Microsoft group product manager Matthew Price said the kit is intended for use by departments of between six and 10 people who have access to an online network connection.

"This is a group that hasn't been addressed until now," said Microsoft Office product manager Andrew Dixon.

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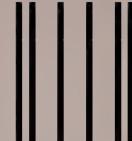
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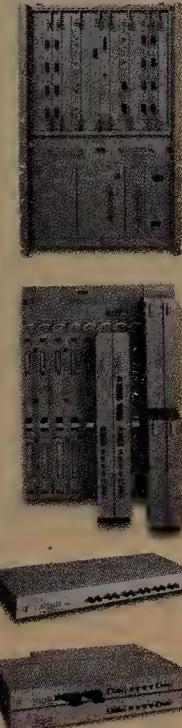
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Circle Reader Service #19

Nortel brings call center management into Windows age

By David Rohde

Dallas

Northern Telecom, Inc. is giving a Windows-based user interface to call center management, which in many organizations remains an outpost of command-

line terminal emulation.

The company last week unveiled the Symposium Call Center Server, an applications package that acts as a call-routing and performance-reporting adjunct to Nortel's Meridian 1 automatic call dis-

tributor (ACD).

The Symposium software, running on a Windows NT server, combines the functions of several existing Nortel call center management applications that utilize terminal emulation interfaces. Plus, it adds hooks to Open Database Connectivity (ODBC)-compliant databases, enabling call-routing decisions to be made based on customer information scattered throughout the enterprise.

Still, analysts said that in many respects Nortel appeared to be playing catch-up to its main ACD competitors with the Symposium server. Lucent Technologies, Inc. already offers the CentreVu Call Management System, a Unix-based server that offers real-time call center performance data and TCP/IP connectivity to enterprise databases. Lucent also includes a Windows 95 client application that enables supervisors to reassign agents to different tasks, based on the volume of calls to particular 800 numbers.

Aspect Telecommunications Corp. offers the CustomView family of Windows-based applications that grab information out of ODBC-compliant databases for call-routing decision support and perfor-

mance reporting.

Nortel officials said Symposium will go beyond competing products by melding advanced reporting capabilities with computer-telephone integration technology and call routing by agent skill set. The skill set feature enables the ACD to route each call based on an assessment of each agent's skills, such as product knowledge or proficiency in a foreign language.

The Symposium server, expected to be available late this year, also will allow call center administrators to devise their own reports. Nortel's current management reporting system, known as Meridian MAX, offers only canned formats, while Lucent's CentreVu and Aspect's CustomView offer custom reports.

"It's a quantum leap from MAX to [Symposium]," said Sheila McGee-Smith, director of analysis and forecasting at The Pelorus Group, a research firm in Raritan, N.J.

"I don't think the MAX is particularly competitive," she said. Like competitive offerings, Symposium server is fairly expensive.

Installing both Meridian 1 and Symposium software costs anywhere from \$700 to \$5,000 per seat, said Gail Young, Nortel's call center marketing manager.

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NAME CALLING

Symposium is not only the name for Nortel's new call center server but also the new name for the company's family of call center applications.

The applications include:

- Interactive voice response
- Unified messaging
- Multimedia conferencing
- Telephony services for NetWare and Windows NT
- Call center professional services

Boundless expands net computer family

By John Cox

Austin, Texas

Boundless Technologies, Inc. last week released a trio of network computers (NC) designed to give end users access to existing applications as well as new ones built from Java components.

The company's Viewpoint Thin Client computers feature a common hardware base anchored by a 586-class Advanced Micro Devices, Inc. processor. However, each device features a different software package to create a distinct client look and feel.

The idea behind the new NCs is to let corporate MIS groups replace millions of dumb terminals with GUI-based thin clients that can access homegrown and Windows applications, and later, Java applications.

The low-end Viewpoint Thin Client Model 100 supports terminal emulation for connectivity to various hosts. The mid-range Model 200 is configured to access server-based Windows applications via Citrix Systems, Inc.'s WinFrame multi-user Windows NT software. The high-end Model 300 includes the Windows server support and also runs Microsoft Corp.'s Internet Explorer, a Web browser that supports Java applets.

"We're focused on Windows and Windows performance," said Terry Shagman,

director of strategic alliances for Boundless. The goal is to give corporate customers a low-cost device that fits into a Windows application environment but can be upgraded with additional memory and video support as needed.

All three Viewpoint models are designed to plug into existing networks and are equipped with the standard expansion slots and ports found on most Intel Corp. processor-based PCs running Windows. The NCs are available now.

The Viewpoint Thin Clients extend the original crop of Boundless NCs. The new models are expandable to 64M bytes of memory, whereas the previous devices topped out at 32M bytes. All Viewpoint models have the same powerful processor, while the older NCs used two different and less powerful CPUs.

In addition to the NCs, Boundless introduced a management application called Viewpoint Administrator that lets desktop managers set up and control NCs as well as manage user access to applications and data. Version 1.0, running on the Citrix WinFrame server, will be available in June. The server license costs \$295, and a site license costs \$895.

Later this year, Boundless will release a version of Viewpoint Administrator for Windows NT Server.

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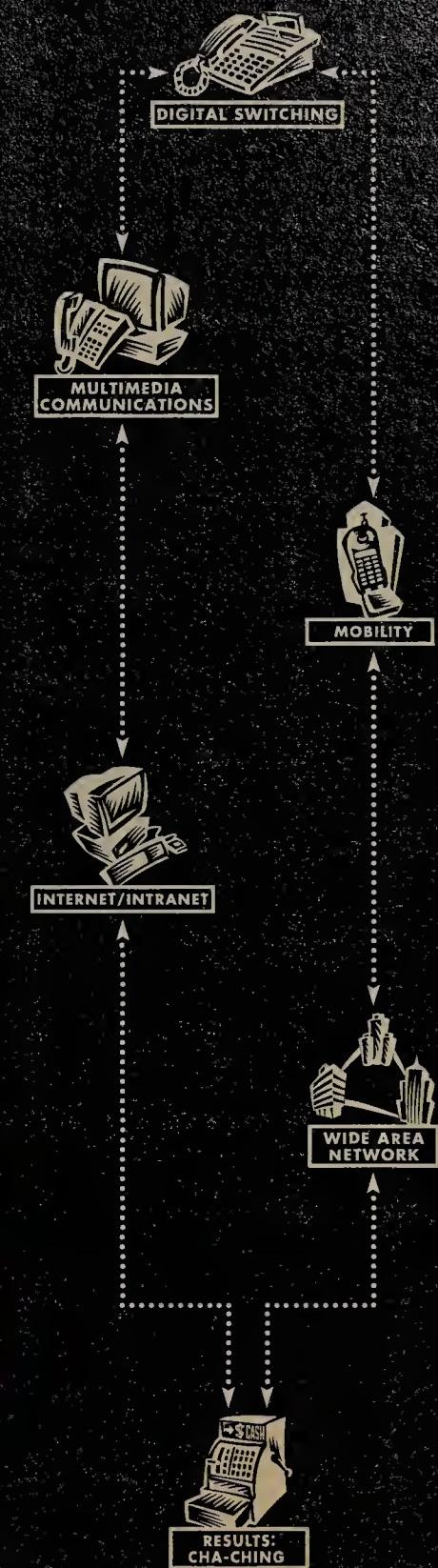
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Circle Reader Service #22

Olsen bursts the NC hype balloon

 Ken Olsen's new company may not be as big as Digital Equipment Corp., which he founded, but it is at the center of one of the biggest network industry trends today — thin-client, or diskless, computing.

Olsen's Advanced Modular Solutions, Inc. was established in an attempt to increase desktop computer manageability and decrease the cost of ownership. Much of the strategy revolved around removing local storage from desktop machines and driving them from a server.

Last week, the company announced a \$958 Secura KH Pentium-based client, which runs all versions of Windows, as well as OS/2 and Java.

Network World News Editor Doug Barney caught up with Olsen to get his take on all the Java/thin client hullabaloo.

When was Modular founded?
The very end of '92.

When did Oracle Corp.'s Larry Ellison

and Sun Microsystems, Inc.'s Scott McNealy start pounding the drums about network computers (NC) and thin clients?

That was a year ago, October.

It sounds like you were ahead of the curve.

That's not quite a fair comparison.

Most of the early [NC] talk was about a much less expensive home computer. We had a completely different approach — to offer a quite traditional PC that runs the normal operating systems, including OS/2 and NT, in addition to Windows and DOS, and to run all the applications, but just as they are.

The thing we offered that was unique was diskless, floppyless and CD-less. It only ran company software and was designed for company use.

The way that the NC vision has evolved, though, is to go after the corporate market and store the applications on a server. It seems like the main difference between what the NC vendors are doing



Computer pioneer
Ken Olsen

and what you are doing is that they want new stuff built from the ground up for Java, whereas you are pushing existing solutions.

Yes. We do Java by emulation and, as far as we are concerned, Java is not the problem right now. The problem is doing ordinary things and, in fact, limiting the job to what ordinary things have to get done.

What's your take on Java-based NCs?

[The role NCs] will play is a matter of people's attitude. People don't want to be left behind in technology. NCs will be quite popular just because few people are analyzing why they want something. They look at headlines and go from there.

How important do you think Java will be in the long run?

I thought it was all foolishness for a long time because Microsoft owned everything, but apparently I'm wrong, and that's the limit of my Java knowledge.

It seems like a lot of large companies, including Digital, have fallen in lockstep with Microsoft's direction. What is the impact of that on the computer market?

It's hard to tell, but I hear more and more people disillusioned with the instability of NT. These people are either going or desiring to go to alternate systems, even though those systems are not as powerful, just because those people love the old days when things always worked. The idea of crashing regularly is just disillusioning

Get more online:

- A complete transcript of our interview with Olsen
- A history of the computer by the man who cofounded Digital with Olsen
- A history of the PDP — the computer that made Olsen famous



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people. So there appears to be a market out there growing for alternatives that do things simpler and are more disciplined, more controlled and always work.

How would Digital be different today if you had stayed in charge?

I've thought about that many times, but I never say anything. My history has always been to solve problems. We rarely had the fastest computer. We did take the best care of customers.

What are your responsibilities at Modular?

Oh, doing everything. At Digital I spent most of the time in finance and organization; here, I'm involved most of the time in technical things, often the physics, packaging and electrical engineering part of it.

Epicon to give apps users what they need

By Chris Nerney

New York

A start-up last week unveiled software for reducing lengthy download times for Windows applications over the Internet or intranets by delivering the applications in small pieces as users need them.

Epicon, Inc. officials said the company's Altis software can be used to put Windows applications on customers' Web sites for immediate use by employees using thin-client machines.

PROFILE: EPICON, INC.



Headquarters: Waltham, Mass.

Founded: 1994 by Steven and George Domenikos

Finances: \$3.5 million in private equity

Product: Altis, software that enables access to Windows applications through the Internet

utility within the administrator program analyzes the structural makeup of the application and provides instructions for the client on how to run the application.

Rather than using the network to deliver an application interface or an entire application to a desktop, Altis enables networks to "act like a computer" by feeding users objects needed to accomplish various tasks as they arise, said Michael Goude, an analyst at Patricia Seybold Group, Inc. in Boston. For example, Altis would not deliver the dictionary component of a word processor application until the user asked for the spell-checking function, he said.

Several other companies are offering products for thin-client environments that allow access to Web-enabled applications. Epicon competitors include Citrix Systems, Inc. of Fort Lauderdale, Fla., which just announced a partnership with Microsoft Corp. (see story, page 17); New Moon Software, Inc. of Santa Clara, Calif.; and Exodus Technologies, Inc. of Bellevue, Wash.

Epicon, based in Waltham, Mass., has started beta-testing Altis with Lotus Development Corp., United Parcel Service of America, Inc. and Digital Equipment Corp.

A July release is expected. Pricing for Altis has not yet been determined.

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IBM purges old SNA gear

By Michael Cooney

Raleigh, N.C.

IBM last week cleaned some SNA cobwebs out of its closet by eliminating old OEM equipment and killing off a few LAN connectivity products.

The company announced it would pull 21 models of the venerable 3174 Establishment Controllers it had sold to third parties for resale since the late 80s. The 3174 ties 3270 devices to SNA mainframes.

Big Blue will also eliminate four 3172 Interconnect LAN gateways and seven 8235 Token Ring concentrators — all effective July 25. IBM is not offering upgrades or replacements for the boxes (see graphic).

The purge could lead to price increases in the company's remaining products because IBM is no longer under competitive pressure to drive prices down, analysts said. It also leaves users with fewer choices and the possibility that the boxes could become scarce.

To be discontinued . . .

Effective July 25, IBM will stop selling the following products:

- 21 3174 controllers (including Models 21H, B0R, B1R, B2R, M1R, N1L, P1H and P4R)
- Four 3172 controllers (Models BT3, 390, 103 and P02)
- Seven 8235 Token Ring concentrators (including Models I40, 021 and 052)

"Our underlying 3174 models remain unchanged, but in terms of overall 3174 sales, we're pretty much the only player now," said Robert Judge, manager of WAN products for IBM.

Other previously competitive vendors, such as Memorex Telex, are out of business or no longer compete in the controller arena.

Judge said IBM continues to maintain 3174 and 3172 development here.

"Mainframes with lots of old 3270 terminals still need those 3174 controllers, and you can't run most MVS consoles, which control the mainframe, without a 3174 and 3270 terminals — so there is still a need for them," said Ken Smith, manager of systems software for the Canada Mortgage & Housing Corp. in Ottawa.

Analysts said the move reflects the cost-cutting measures IBM needs to undertake to remain competitive. In the past, IBM supported products, especially any SNA-related devices, for what seemed like forever.

"These devices were at the end of their rope," said Frank Dzubek, president of Communications Network Architects, Inc., a consultancy based in Washington, D.C. "IBM wants to prune costs and re-evaluate the products it needs to keep in its portfolio."

In the 3174's case, the move also

reflects the changing way SNA/3270 devices can now access mainframe resources. For example, traditional 3270 dumb terminals have largely been replaced by 3270 emulation software packed inside PCs. These PCs are usually

clustered and linked with the mainframe via a Microsoft Corp. SNA Server or IBM Communications Server.

For the 3172, the message is less clear. Interconnect controllers are a \$232 million business, according to International Data Corp. Moving away from that spells a change in IBM strategy, analysts said.

"I wouldn't call it a major shift, but

much of the function of the 3172, especially in the [Enterprise Systems Connection] connectivity arena, will be taken over by the 2216," Judge said.

The 2216 Multiaccess Router, which only became available last month, supports a variety of SNA and TCP/IP connectivity options that eliminate the need for a 3172. ■



Notes

Continued from page 1

Lotus officials last week declined to discuss details of the May 20 announcement.

However, sources said the imminent Notes 4.6 beta release will include: support for Post Office Protocol 3 (POP3); navigation improvements that allow ac-

cess to multiple application databases from a single E-mail interface; and integration with Microsoft Corp.'s Office97 and Lotus' SmartSuite 97 application packages. Release 4.6 is due to ship next month.

Originally slated for a third-quarter debut, Domino Server 4.6 now reportedly will ship this summer with support for

Lightweight Directory Access Protocol and Internet Message Access Protocol 4.

In addition, the upgrade is said to take advantage of new HTTP technology within the IBM Internet Connection Server at the heart of Domino.

The session-oriented HTTP technology speeds Web page retrieval by transmitting text, graphics and Java applets, as

well as other information, over a single connection.

"[This] would excite the hell out of me, and probably a lot of people out there," said Eric Sachs, chief technology officer with Interlant, Inc., a Houston-based Notes Public Network that hosts Domino Web sites. The result would be faster service for Interlant's corporate customers, he said.

On the client side, the addition of POP3 support to Notes 4.6 is a necessary response to Outlook, the new client for Microsoft's Exchange Server 5.0 messaging/groupware platform, said David Marshak, an analyst with Boston-based Patricia Seybold Group, Inc.

"[POP3 support is] very much aimed at current Notes customers," Marshak said.

"They're making [Notes] a mail-centric client," Macomber said.

"Instead of having to jump around the Notes desktop, you'll be able to go to your mail database and have access from there to the usual places you go."

"[It's] a tactical move to keep [Lotus'] own customer base from adopting other mail clients," he said.

The interface improvements that Lotus is dishing up in Notes 4.6 should be well received, too, particularly by Notes newcomers, said Hal Macomber, vice president of consulting and product development at Quality Decision Management, Inc., a workflow solutions provider in North Andover, Mass.

"They're making [Notes] a mail-centric client," Macomber said. "Instead of having to jump around the Notes desktop, you'll be able to go to your mail database and have access from there to the usual places you go."

Macomber, whose company is a Lotus Premium Business Partner, is also eagerly anticipating enhanced calendaring and scheduling features in Release 4.6.

"If you want to do something for a group or for an enterprise, there has to be much more programmatic control [than is currently available in Notes]," Macomber said.

"What we understand is that we're going to get [this control]," he said.

The speed with which Lotus is cranking out new features is seen by some as evidence of the IBM/Lotus marriage paying dividends.

"Improving those timetables is doing some really good stuff for us," said Interlant's Sachs.

"IBM's deep pockets don't hurt," he said.

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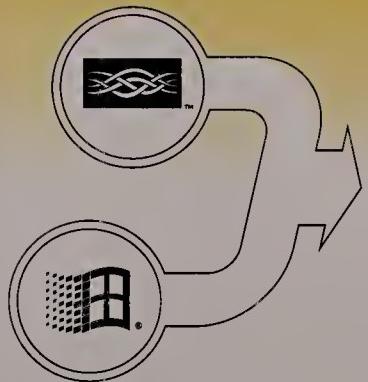
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Microsoft BackOffice
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Comprehensiveness: Every BackOffice server will do its appointed task entirely and efficiently. Furthermore, the family of BackOffice products, taken together, covers a comprehensive range of business needs. And as businesses demand more from technology, BackOffice will continue to anticipate these demands.

Simplicity: A solution should not be any more difficult than it has to be. Thanks to their integration with Windows NT Server, thanks to their familiar interface, thanks to a bunch of basic design decisions, you will find BackOffice server applications to be easier to install, deploy and administer than any other system. It's that simple.

As goes BackOffice, so goes Windows NT Server. These three philosophies also apply to the relationship between BackOffice server products and Windows NT Server. Not only is Windows NT Server famously easy to administer, but its integration with the BackOffice family of products means that most administration tasks need only be performed once—for example, you just create one account per user, no matter how many applications they use. And Windows NT Server is inherently scalable—you can run a single Windows NT Server in a mixed environment or you can build a global network that runs entirely on Windows NT.



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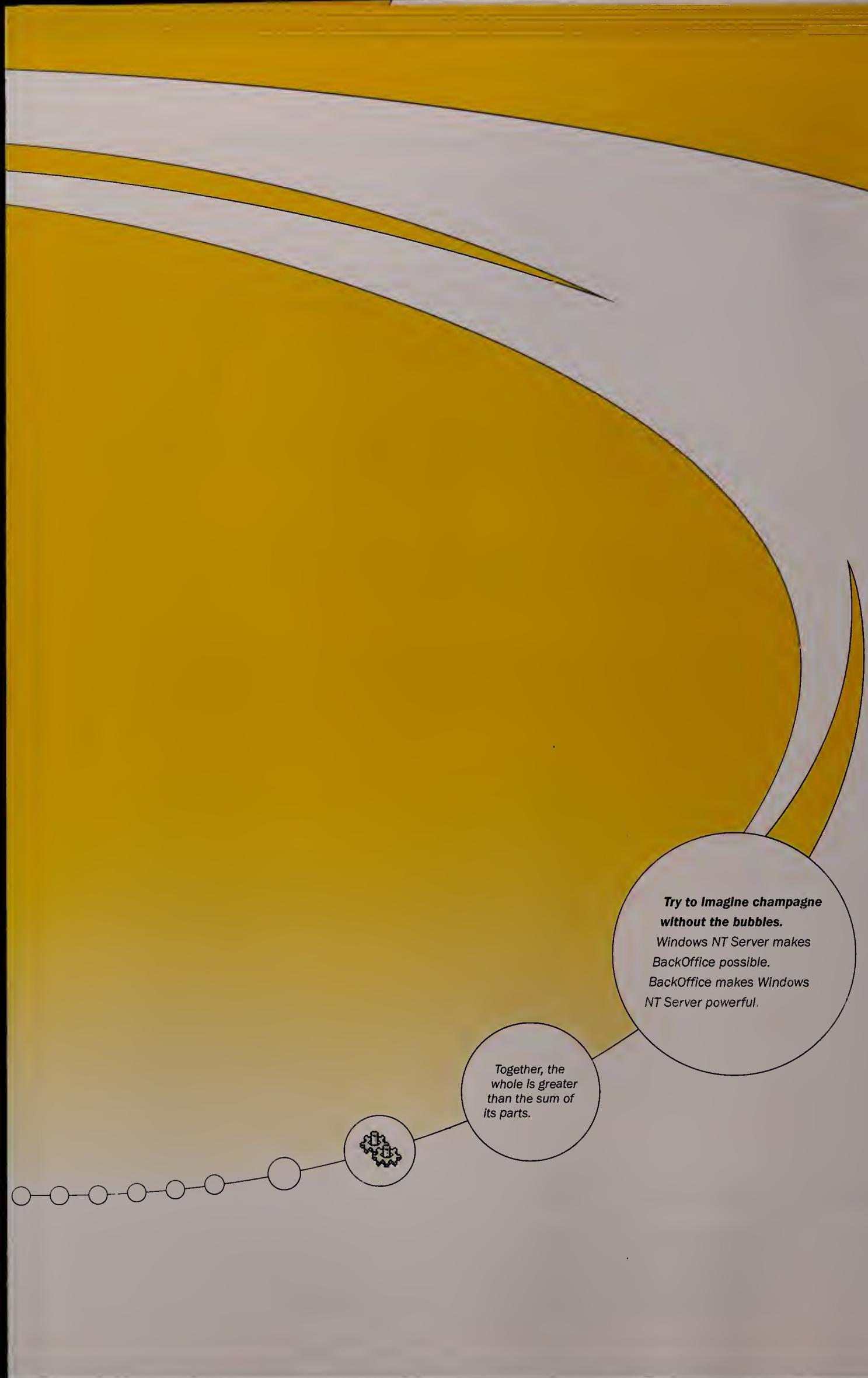
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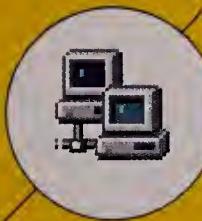
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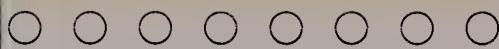


*BackOffice is not a noun.
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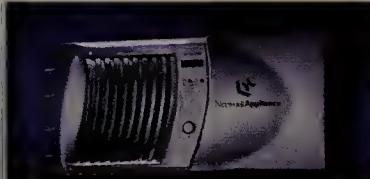
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Network options include single and multiport 10M/100M bit/sec Ethernet, Gigabit Ethernet, single- and dual-attached FDDI and ATM. The product will be available next month starting at \$70,000.

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Network Peripherals, Inc. (NPI) has announced two aggressively priced Fast Ethernet switches. The NuSwitch FE-224 is a managed 24-port 10M bit/sec Ethernet switch with two 100M bit/sec Ethernet uplinks. The device is priced at \$75 per port, which is about the same per-port price as a typical shared Ethernet hub. Also, NPI rolled out the NuSwitch FE-208 segment switch, which provides eight switched Ethernet ports and two switched Fast Ethernet ports for \$99 per port. Both products will ship in July.

© NPI: (408) 321-7300

3Com Corp. has unveiled its 3Access VPN architecture, which allows customers to deploy and manage virtual private network-based remote access nets. Two key components are transparent access services and tunnel monitoring software. They will be included as part of 3Com's TranscendWare net management software by year-end.

© 3Com: (408) 764-5000

Citrix to help fatten up Microsoft thin-client plan

By Christine Burns

Redmond, Wash.

Microsoft Corp. last week announced it will add multiuser capabilities to Windows NT Server with help from Citrix Systems, Inc.

Under terms of a \$175 million licensing agreement, Microsoft will take multiuser memory management and CPU scheduling extensions that Citrix developed for Windows NT 3.51 and add them to NT 4.0 and the upcoming NT 5.0.

The multiuser operating system technology will let companies deploy NT servers that run a variety of DOS and Windows desktop applications that are accessible to multiple end users operating thin-client machines. This setup gives companies central control of networked applications and requires only that an application's graphical display runs on the desktop machine.

It also fits into Microsoft's plans for the Windows terminal, a network computer rival that Microsoft CEO Bill Gates defined as "the only true thin client." The proposed terminal — a stripped-down desktop machine for which Microsoft has yet to set specifications or raise industry support — will not run any operating system software. It will receive only screen images of applications running on a multiuser version of NT Server.

Industry analysts said Citrix is an obvious partner because it has delivered multiuser server technology in its NT-based WinFrame product for three years and has an installed base of more than 500,000 users.

Microsoft earlier this year balked at a Citrix alliance, and Microsoft said it was moving for-

ward with its own multiuser technology, code-named Hydra. But the company changed its tune to get the new NT feature to market more quickly, said Paul Maritz, Microsoft's group vice president of applications and systems.

Microsoft will tap into Citrix's expertise "to support very low-cost devices attached to a Windows NT Server," Maritz said.

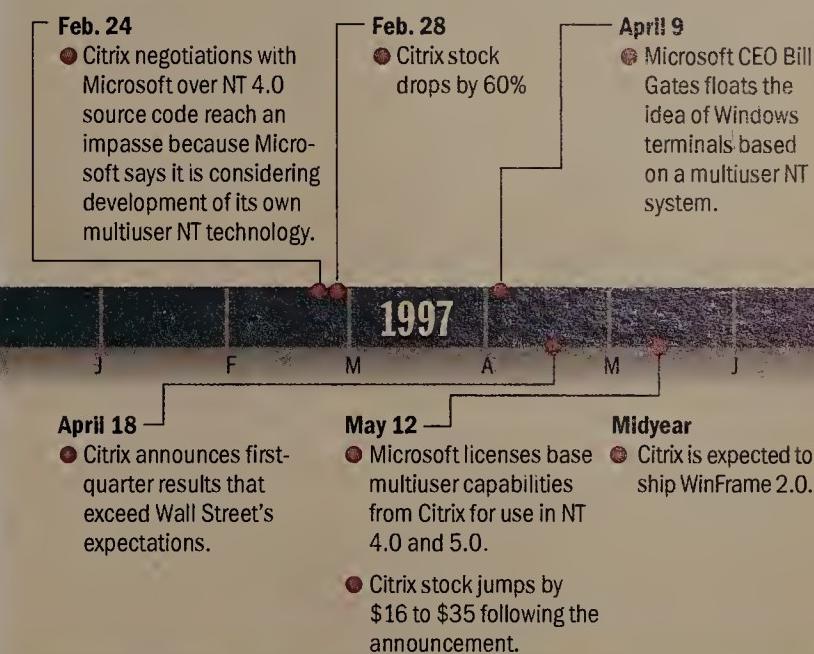
The deal boosts Citrix, which saw its stock tumble after Microsoft earlier this year indicated it would develop a competing technology. Citrix stock jumped \$16 to \$35 last Monday after the Microsoft-Citrix announcement.

"Through this agreement, Microsoft and Citrix have executed... a renewal of vows," said Citrix Chairman Edward Iacobucci.

Multiuser support for NT 4.0 systems will ship this year and for

Tracking the Microsoft-Citrix relationship

The companies' eight-year partnership recently became strained but appears to be on the mend.



NT 5.0 next year, Maritz said.

Multiuser NT will support Citrix's Intelligent Console Architecture (ICA) protocol and Microsoft's T.Share protocol for passing screen images from an NT server to Windows

terminal clients.

Citrix, which resells NT 3.51 with multiuser extensions as its WinFrame offering, will unbundle its ICA-based management services from NT in future WinFrame releases. ■

FORE bolsters Ethernet-to-ATM switch

By Jodi Cohen

Pittsburgh

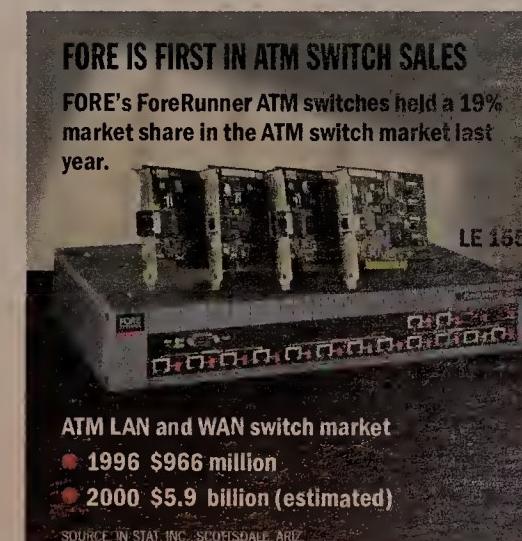
FORE Systems, Inc. last week announced it is pumping up its Ethernet-to-ATM switch with four new modules that enable the switch to support up to 30 times as many network-attached devices.

Once designed simply to provide dedicated pipes to desktop devices, the ES-3810 can now handle more than 8,000 devices via the new modules, which can link hubs and small switches that, in turn, connect to scads of desktop devices. The offering lets customers preserve their investment in Ethernet hubs and switches while migrating to ATM, industry observers said.

The new offerings include eight-port autosensing 10M/100M bit/sec Ethernet modules for copper and fiber wiring as well as a 16-port Ethernet copper and 12-port Ethernet fiber module. Outfitted with the new modules, the ES-3810 can now support as many as 8,192 media access control (MAC) addresses.

Previously, the switch maxed out at 250 MAC addresses.

"Customers can either use the box to provide dedicated bandwidth directly to the desktop or provide ATM connectivity for entire departments while protecting their investment in



Ethernet devices," said Jeff White, director of marketing for FORE's enterprise business unit.

The new modules plug in to a dual power supply chassis that

supports two 155M bit/sec ATM uplinks for backbone connectivity.

The enhanced ES-3810 competes with devices such as 3Com Corp.'s SuperStack II Switch 3000 and Cisco Systems, Inc.'s Catalyst 3100, industry observers said.

The ES-3810 switch modules include per-port support for all nine Remote Monitoring groups, which allow net managers to view traffic and statistics on remote LAN segments. In addition, the switch can be managed via FORE's ForeView 4.1 software, which provides network mapping and virtual LAN configuration capabilities.

The 16-port Ethernet module costs \$3,495, and the eight-port 10M/100M bit/sec module is priced at \$5,995 for copper wire and \$9,995 for fiber wire. The 12-port fiber module costs \$7,995.

All products are available now.

© FORE: (412) 742-4444

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www.nwfusion.com



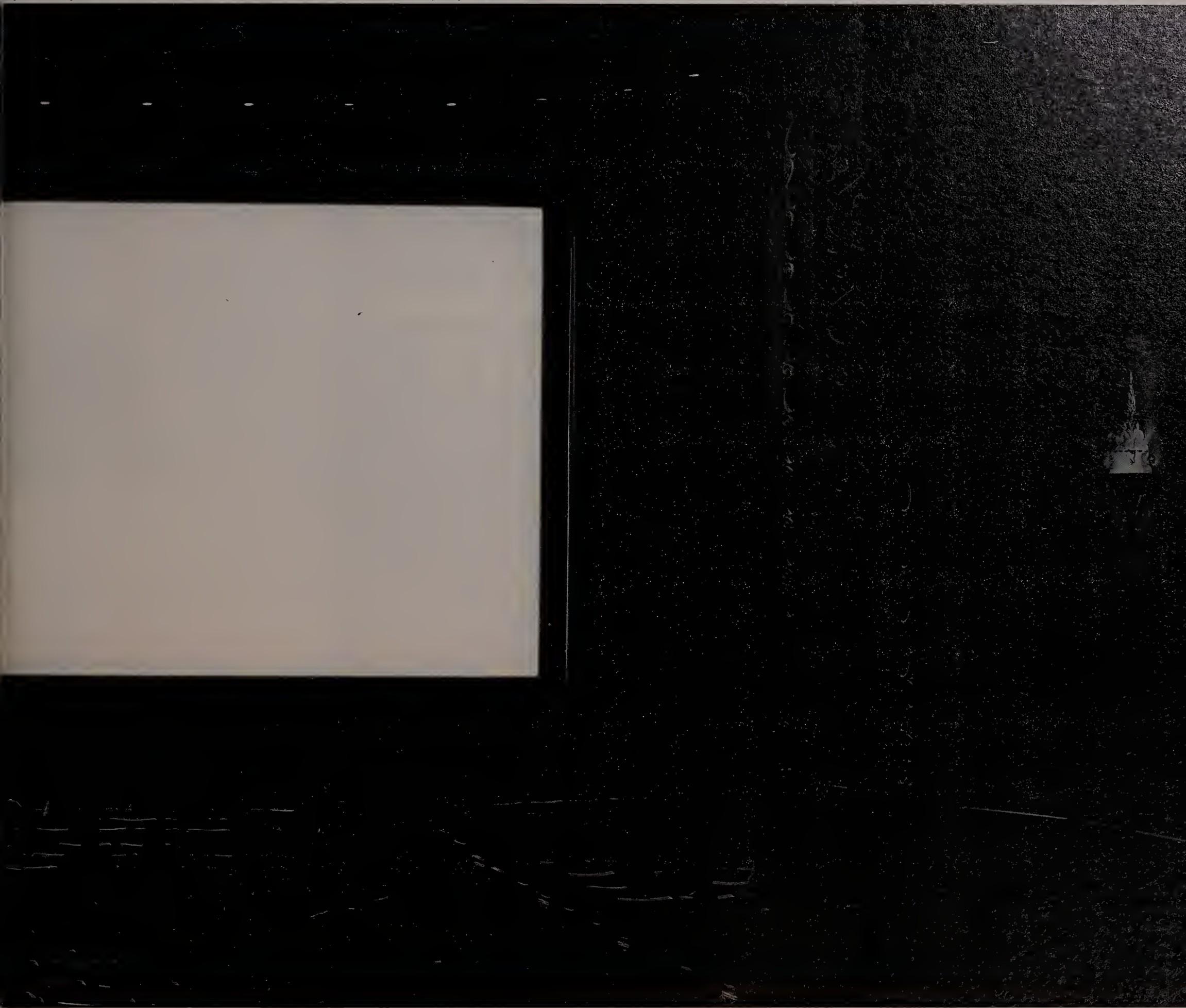
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Moving beyond Merchant Server

For those of you who thought Microsoft Corp. had the right idea — but the wrong implementation — with Mer-

chant Server electronic commerce software, it's time to take another look.

The company recently introduced the

Site Server 2.0, Enterprise Edition, which shows all the promise of being the full-fledged commerce server Merchant Server hinted at, but at just one-tenth the price.

Merchant Server was touted as the quick and easy way to create, maintain and operate virtual retail stores on the Worldwide Web. When I looked at the software

last fall, however, I concluded that it sounded — and was — too good to be true. Simple math showed you'd need to invest more than \$20,000 to set up your first retail site and \$4,000 or more for each additional site. Further, I noted Merchant Server brought you little in the way of functionality or ease-of-use.

Evidently, lots of people told Microsoft the same thing. So now the company is pitching Site Server 2.0, Enterprise Edition, which includes Commerce Server — formerly Merchant Server — and more. The package will cost only \$1,495 and will greatly extend the functionality found in Merchant Server 1.0.

Among the new components in Site Server are the StoreFoundation and StoreBuilder wizards, which promise faster site development. Tighter database integration and a richer programming interface should allow developers to create more interactive and information-packed sites by making extensive use of Microsoft's Active Pages technology. It creates Web pages on the fly in response to readers' queries and profiles.

The newly developed Microsoft Wallet client technology promises heightened security for credit card transactions, as well as future digital cash options, while the Order Processing Pipeline presents a rules-based structure for taking, processing and fulfilling orders. Commerce Host Administrator promises easier-to-use graphical tools to monitor the site.

Site Server's components are also designed to work with other site creation tools such as Microsoft FrontPage.

No matter what kind of company you work for, Site Server promises to enable better, faster, more secure electronic transactions within your value chain — the just-in-time manufacturing concept of an unbroken line consisting of you, your suppliers and customers from the raw materials down to the final end user.

Microsoft appears to have learned from the Merchant Server misstep and it's banking industry and supply chain initiatives. The company has tied things together to create a business transaction system adaptable to almost any business.

Dave Kearns

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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Tip of the week

TechnologyNet, Inc. (www.technologynet.com) offers one-stop shopping on the Web for network and computer products and services. The company's Web site has information about more than 1,200 vendors and products, detailed profiles of more than 1,000 resellers and a suite of services to inform customers about computer technology.

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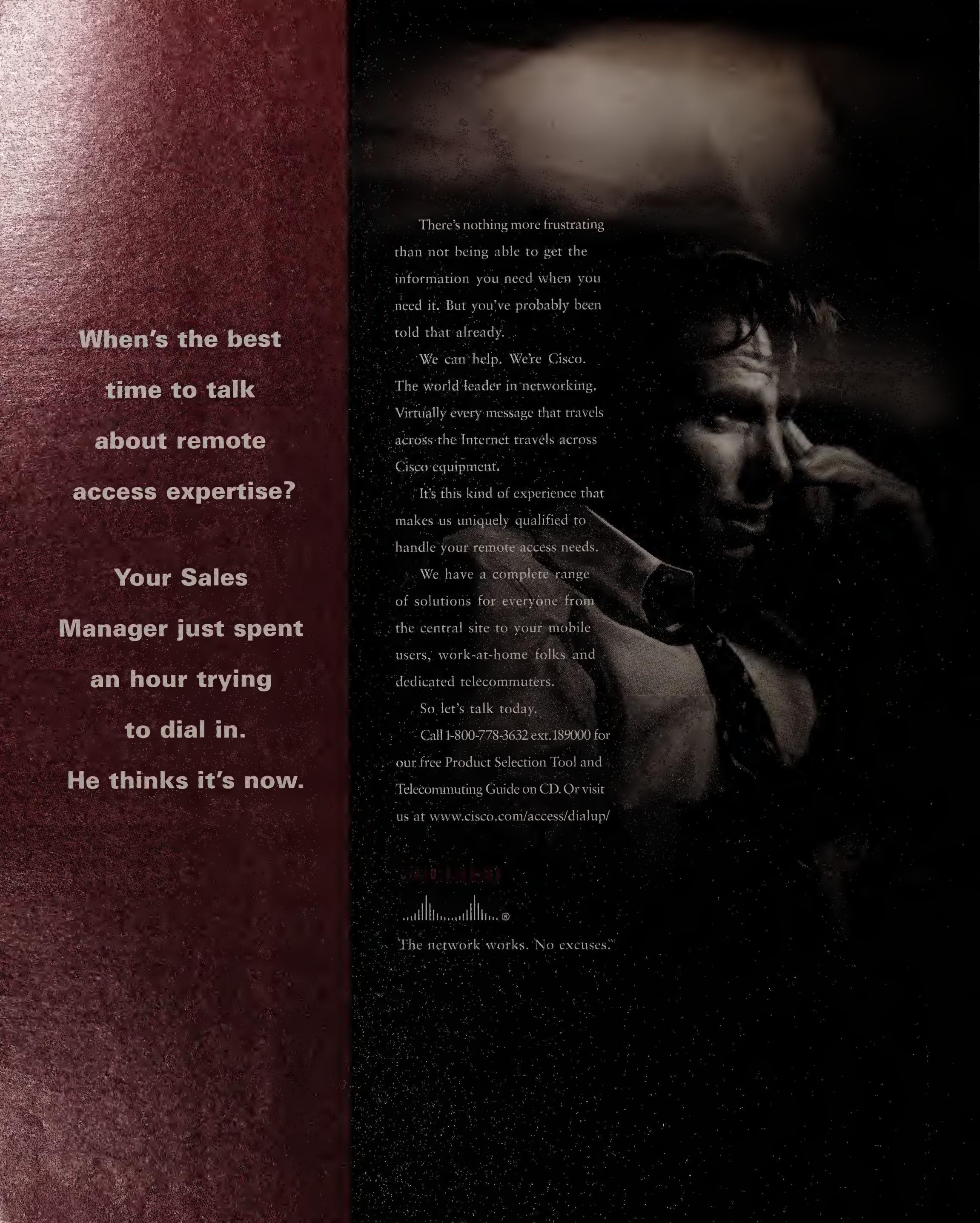
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Briefs

Hewlett-Packard Co. rolled out a new version of its storage management software designed to allow more extensive backup of data than previously possible.

HP OpenView OmniBack II 2.5 features a new enterprise backup console for central control of multiple distributed backup environments.

The software also increases the number of supported systems and total data handled by a factor of four from the earlier version.

HP also announced today a planned integration of HP OpenView OmniBack II with EMC Corp.'s Symmetrix Remote Data Facility and EMC TimeFinder.

HP OpenView OmniBack II 2.5 is expected to begin shipping in June with an entry price of \$3,800. The new manager-of-manager feature costs \$16,000. Integration with the EMC products is expected to be available later this year.

© HP: (800) 752-0900

Wang Laboratories, Inc. has signed a letter of intent to resell and service Cisco Systems, Inc. products worldwide.

Wang will send 30 of its service engineers to the Cisco Certified Internetwork Expert program and add Cisco gear to three of its service centers in Texas, the U.K. and Australia.

© Wang: (508) 967-5000

Multi-Tech Systems, Inc. is shipping the Commplete Communications Server, a dial-up hardware platform that includes support for ISDN and 56K bit/sec modems via T-1 or Primary Rate Interface ISDN lines. Commplete ships with Multi-Tech's RASExpress, which supports Remote Authentication Dial-In User Service security.

The box supports as many as four T-1/PRI lines, each powered by its own Pentium processor and a 10M bit/sec Ethernet LA interface.

Fully loaded, Commplete costs \$55,196.

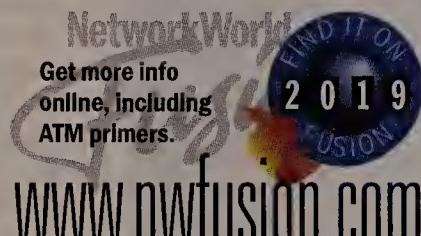
Hypercom rolls out low-speed ATM

Vendor supports T-1 speeds for cell relay, frame relay and quality of service.

By Tim Greene

Phoenix

Hypercom Network Systems, Inc. has decided the time is right for low-speed ATM.



Next month, the company will ship the T-1 ATM Interface Module (AIM) for its Integrated Enterprise Network (IEN) hybrid access switch/router.

With AIM, Hypercom said it hopes to help customers migrate their networks from frame relay and time-division multiplexing (TDM) to cell-based technology.

"We can meet the needs of each branch without customers having to overinvest in upgrading their entire networks," said Paul Wallner, president of Hypercom.

The new addition to the IEN

platform lets users run frame relay or TDM traffic to some sites and ATM to others.

The platform has interfaces for all three technologies and can run them simultaneously. It also supports ISDN and X.25.

We are family

The IEN switch/router family has four members, one designed for large central sites and three for regional or branch offices.

IEN supports switching and routing and sits at the edge of the network, between LAN devices and the wide area.

The new ATM module gives users entry into the ATM world without waiting for carriers to offer it at T-1 speeds.

Carriers have said they will offer such services later this year.

With the Hypercom module, however, customers could set up an ATM link over an existing leased line and integrate that with frame relay or other services over private lines or public networks.

Wallner said with its variety of interfaces, the IEN will let users migrate remote offices to ATM as the need arises.

With ATM, remote users can support separate qualities of service for differing traffic types, with time-sensitive traffic such as voice receiving the highest priority.

Frame quality, too

The company has also introduced Hypercom Optimal Access, its support for quality of service (QoS) over frame relay networks.

Following the lead of frame relay switch vendor Cascade Communications Corp., Hypercom's new software supports four qualities of service: constant



"Router vendors that have focused on data and IP will face serious challenges in consolidating data, voice and video over ATM."

Paul Wallner, president, Hypercom Network Systems

frame rate (CFR), real-time variable frame rate, nonreal-time variable frame rate and unspecified or available frame rate (AFR).

Applications that could take advantage of the service qualities range from voice and video on CFR to nonmission-critical LAN traffic such as E-mail on AFR.

To guarantee QoS, Optimal Access prioritizes traffic by protocol or port, fragments lengthy frames, uses congestion notification and strictly enforces committed information rates (CIR).

CIR is the minimum bandwidth a given application is guaranteed.

The ATM module is available next month, and the list price is \$2,700.

Optimal access comes with IEN and is a free upgrade for current users of the devices.

© Hypercom: (602) 504-5000

Network management

Vendors take wraps off apps monitoring tools

By Jim Duffy

Las Vegas

Two network management vendors announced tools to help users monitor application response time and behavior.

Network Tools, Inc. last week expanded its suite of software tools that help users design, test and validate networks and network devices. And Network Intelligence, Inc. rolled out software for measuring application traffic and response time and its impact on network utilization.

Network Tools' software, called Chisel, integrates application baselining, network stress testing and firewall testing capabilities. Chisel also monitors end-to-end behavior and perfor-

mance of applications under varying loads across a network, the company said.

From a single PC, Chisel can launch thousands of application sessions and track the characteristics and performance of each session, Network Tools said.

Metrics such as load and response time can be monitored with Chisel, which then graphi-

Carving out a niche

Features of Network Tools' Chisel:

- ▶ Application baselining and quality-of-service monitoring
- ▶ Network architecture, device and application stress testing
- ▶ Firewall configuration testing

cally documents the data for analysis.

Chisel 1.0 supports File Transfer Protocol, HTTP, ping, SNMP and telnet applications. Users can define multiple sessions

per application, each with a different IP address and behavioral characteristics.

For firewalls, Chisel can check Layer 3 filters, such as an IP address, subnet mask and port, and application layer filters.

It can also test firewalls for behavior under load by filling router caches with session traffic and gauging its impact on the access list.

Chisel competes with Ganymede Software, Inc.'s Chariot 2.0 package and Optimal Networks Corp.'s Applications Expert. Analysts said Chisel differs from these products in some

key ways.

"Chisel has a direct target of testing firewalls, which the other two products don't do explicitly," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The Optimal product also traces "real" application activity, McConnell said, while Chisel generates multiple connections from a single system. Ganymede's product uses scripts to characterize an application rather than executing it, McConnell added.

Chisel runs on Windows NT 4.0 and Windows 95 platforms, and pricing starts at \$3,000. The product will ship in August.

Contoured management

Separately, Network Intelligence's Contour software pro-

See Chisel, page 24

Cabletron, partners preview data mining

By Jim Daffy
Las Vegas

In preparation for rolling out a management data repository, Cabletron Systems, Inc. is working with three software developers to add data mining capabili-

ties to its Spectrum management system.

At NetWorld+Interop '97, Cabletron and Spectrum developers GK Intelligent Systems, Inc., Syllogic BV and Thinking Machines Corp. demonstrated the ability to sift through volumes of management

and business data to look for patterns that indicate how IS resources will behave. This ability to "mine" data will help users quickly retrieve a handful of useful information from extensive historical records.

Because of its ability to condense large amounts of data into smaller chunks of meaningful information, data mining will be key to vendors' efforts to add data ware-

houses or repositories to management platforms. Cabletron is expected to ship Spectrum's data repository later this year (NW, Dec. 9, 1996, page 1).

Analysts said data mining is intriguing but could cost users a lot of money in storage and processing. "The aspect that they have to contend with is how do they provide a value proposition from a return on investment," said Craig Johnson, director and principal analyst at Current Analysis in Herndon, Va.

Data mining can be useful in tracking service level agreements, pinpointing current and future network faults, and building device, network and system models, Cabletron said. For the latter, users can tap historical data to build a model of a device or IS environment that can be used for monitoring and control.

The model can be combined with business information to define elements that make up a business process, including parameters, such as bandwidth utilization, that affect these processes.

In the NetWorld+Interop demonstration, the Spectrum developers pored through 18 weeks worth of data from Cabletron's corporate IS infrastructure. The data showed performance degradation on a subnet, and each developer had to mine through this information to identify trends and forecast behavior.

The information was useful in helping GK create a virtual model of the Cabletron network with its Smart Behavioral Model Manager application. Smart Behavioral Model Manager allows system administrators to monitor or diagnose managed objects based on behavior patterns.

Syllogic demonstrated the data mining capabilities of its Adaptive Enterprise Management (AEM) application. AEM enables administrators to associate service levels with business applications.

Thinking Machines is working on a data mining technology called Darwin, which employs memory-based reasoning and decision-making as well as neural network technology to diagnose faults in networked systems.

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Chisel

Continued from page 23

vides real-time and historical reports on how applications behave and interact with the network. Contour comprises PC-based software probes, which sit on LAN segments and "read the wire" to gauge behavior anomalies, and domain manager workstations, which collect data from the probes and SNMP agents.

Contour competes with Compuware Corp.'s EcoSCOPE product, said Brian Szabo, president of Network Intelligence.

Delta Airlines Corp. is using Contour to distribute application behavior monitoring across a 15,000 node network, Szabo said.

Pricing for Contour starts at \$17,000.

© Network Tools: (408) 571-2600; Network Intelligence: (415) 494-6473



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provides the powerful ability to visualize and analyze real-time traffic flow across your entire network. Intelligent agents monitor your network infrastructure, keeping your IT staff informed of changing conditions and often making adjustments as needed. What's more, Optivity includes analytical tools for capacity planning to help reduce budget surprises.

Q: • **WILL IT WORK WITH WHAT I'VE ALREADY GOT?**

Of course. It wouldn't be truly adaptive if it didn't. You can adopt this technology at your own pace in cost-justifiable increments. Adaptive Networking even makes our competitors' products smarter and faster. Good news, since you probably already own some.

Q: • **CAN IT GIVE MY BUSINESS A COMPETITIVE EDGE?**

Definitely. You can offer hot, new services and build closer links with customers and business partners. Should they need access to your corporate network from the Internet, you can offer secure virtual private network connections. Want to add voice-over-IP capabilities to link customers and service representatives from your Web site and reduce long-distance phone costs? Adaptive networks can do this and much more.

Q: • **WILL IT WORK WITH THE LATEST APPLICATIONS?**

Applications drive your network needs. That's why adaptive networks shift on the fly to match routing priorities to your applications. For example, financial transactions and video conferencing can take routing priority over e-mail packets and Web browsing.

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Adaptive Networking

Q: • **ALL RIGHT, WHAT IS IT?**

Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

Q: • **WHAT DOES IT OFFER?**

Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

Q: • **WHAT ARE THOSE SCALABLE TECHNOLOGIES?**

Bay Networks products are being developed around industry-leading

reliable and scalable thanks to symmetric multiprocessing and a distributed architecture. In other words, there's no single point of failure to bring down your network. Moreover, the system automatically reroutes traffic as needed to avoid bottlenecks. And you can easily add to, change, and modify your network without disrupting users.

Q: • **HOW CAN I REDUCE NET- WORK OWNERSHIP COSTS?**

Adaptive networks automatically find and configure new devices to save your IT staff considerable time. And thanks to our Autosensing Technology, the system determines which users have 10Mbps or 100Mbps capabilities, for example, and matches them with the bandwidth they need.

Q: • **HOW CAN WE AVOID SURPRISES?**

With Optivity®, your IT staff can proactively manage all the devices in your network as one cohesive system—even if it extends across the Internet. Optivity also



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Briefs

The long-planned Iridium system of 66 satellites, facilitating wireless voice and data applications from one point to another across the globe, successfully launched its first five satellites earlier this month. The system is owned by an international consortium of 18 companies, including Lockheed Martin Corp., Motorola, Inc. and Sprint Corp. Commercial service is slated for late 1998.

AT&T Wireless Services, Inc. has a new head honcho, Dan Hesse, who replaces Steve Hooper as president

and CEO. Hooper and two other AT&T executives resigned earlier this month to join Craig McCaw and his venture, One-Comm LLC, a start-up competitive local access provider. Hesse is an AT&T veteran who joined the company in 1977.

Hesse was most recently vice president and general manager of business development but has also held key executive roles within AT&T's WorldNet Internet group and Network Systems International before it became part of Lucent Technologies, Inc.

Sprint Corp.'s global affiliate, Global One, will resell Hypercom, Inc.'s Integrated Enterprise Network (IEN) branch network routers. The IEN routers are multipurpose boxes, containing an integrated router, multiplexer, protocol converter, DSU/CSU, voice-over-frame relay module and dial-up ISDN backup support.

Global One is the international venture owned by Sprint with France Telecom and Germany's Deutsche Telekom.

AT&T and the U.K.'s Mercury Communications, Ltd. have introduced a trans-Atlantic T-1 (1.536M bit/sec) ISDN dial-up service.

The service is priced at approximately \$8 per minute and is aimed at videoconferencing applications and large file transfers.



Hesse

ISPs will continue to be snatched up by service providers, for their own good

By Denise Pappalardo

GTE Corp.'s planned acquisition of BBN Corp. announced earlier this month is the first acquisition of an Internet service provider by a traditional local exchange carrier (LEC), but it will not be the last (NW, May 12, page 8).

Analysts said LECs will soon go on an ISP buying spree, looking to garner ISP infrastructure and Internet know-how.

Other industry actions, including mergers, acquisitions, partnerships and plain old business failures, will also slim down a market in which approximately 3,000 companies call themselves ISPs.

In addition, when the likes of BBN cannot turn a profit, it is clear the long-term viability of lesser companies is in question.

The numbers tell the story: BBN reported a net loss of \$56.6 million and revenue of \$234 million for 1996. PSINet, Inc., which is still on its own, reported a \$9.3 million loss and revenue of \$25.6 million for the first quarter of this year.

So how is it that ISPs can report such significant revenue but have huge quarterly and yearly losses? Because ISPs do not own the physical underlying facilities, so their operating costs are exorbitant, explained Joel Maloff, president of The Maloff Co., a Dexter, Mich.-based con-

sulting firm. ISPs, except for those owned by facilities-based carriers, such as UUNET Technologies, TCG CERFnet and eventually BBN, do not own fiber.

Therefore, they have to lease fiber connections from traditional service providers such as

ISP mega mergers: More to come?

Three significant Internet service provider mergers have already taken place, and analysts predict even more consolidation. Here's a look at what the market has seen so far and which companies are still on the shelf.

Acquisition announcement date	Purchaser	Purchasee	Price
Sept. 1996	WorldCom	MFS/UUNET	\$14 billion
Jan. 1997	TCG	CERFnet	\$67 million
May 1997	GTE	BBN	\$616 million

ISPs still up for grabs

- America Online
- Digex
- Netcom On-line
- PSINet

Potential ISP shoppers

- Ameritech
- AT&T
- BellSouth
- SBC Communications

AT&T, MCI Communications Corp. and Sprint Corp. That is why the operational costs are so high.

ISPs own equipment such as routers and switches that the T-1s and T-3s connect to, but not the physical plant, Maloff said.

Depending on their size, ISPs can have anywhere from two to hundreds of dedicated T-1 connections, which can cost from \$3,500 to \$5,500 per month.

Larger ISPs also use dedicated T-3 connections that average in cost from \$10,000 to \$20,000 per month.

Because the ISPs have a cash flow problem due to their leased-line costs, they are ripe for the picking, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm.

The LECs will fuel future rounds of merger mania in the ISP world simply because they have the cash, she said.

Potential targets include independent ISPs PSINet, Netcom On-line Communication Services, Inc., America Online, Inc. and CompuServe, Inc., Maloff said.

"We have to wonder how long they can survive without a partner," he said. ■

DSL interest high, but service scarce

By Tim Greene
Las Vegas

Delays in major digital subscriber line (DSL) service deliveries have left eager potential users of the technology disappointed.

While low-speed DSL is already on its way, the fastest DSL service offerings are still developing. Details, such as figuring out which speeds to offer, and how to price and provision the services, are holding up the works.

Anticipation that GTE Corp. and perhaps Bell Atlantic Corp. would announce at NetWorld+Interop 97 plans for broadband DSL services over regular phone lines never materialized.

GTE, instead of announcing a service deployment, said it was expanding trials with Microsoft Corp. employees in Redmond,

Wash. GTE had no details on how long that trial extension would last. Bell Atlantic made no announcements.

"I think it's still two to three years before we get [asymmetric DSL]," said Frederick Ackourney, IS director for CAG Technologies, Inc., an electronic systems engineering firm in Westlake Village, Calif.

He was scouting the technology at Interop to tie together remotely located CAG engineers working on projects. Ackourney is looking for alternatives to help avoid the cost of more expensive connectivity options such as T-1 services, which he said are really too slow for his purposes.

Good enough gear?

Part of what is holding back carriers is the lack of available hardware to support DSL ser-

vices. While many vendors at Interop demonstrated DSL modems that work, they are not necessarily the kind of equipment a phone company would

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ideally want. That equipment would be fully redundant systems that fit into standard-size telco racks and meet the power restrictions on devices in central offices. Such gear is still being refined.

"We're still exploring vendors," said Alan Bugos, a senior member of the technical staff at

GTE Laboratories, Inc. "We are starting to see second- and third-generation equipment, and they've actually got it right." Even so, Bugos was careful to emphasize that GTE had not chosen a platform for the services it is planning.

Bill Hassell, a systems specialist for British Columbia Telephone Co., said BCTel is looking to roll out DSL services that let users customize their service by clicking on an icon on their home computer screen. But nobody makes that kind of package yet, he said.

To meet immediate user demand, telcos may wind up installing available gear and later rip it out as more efficient equipment hits the market, Hassell said. Companies would learn valuable lessons in the process, such as how to provision services and the impact increased broadband access would have on the net-

See DSL, page 28

Datacom's secret plot to take over the world

We went to NetWorld+Interop 97, and Las Vegas was just as usual. Never enough cabs, too hot outside and too much air-conditioning inside.

Attendance at the show seemed a little off. In fact, we could actually walk a straight line through the aisles most of the time without being constantly elbowed, jostled or tripped.

What we saw on the show floor were a host of voice-over-data network products and technologies. There were many booths with live demonstrations of voice over IP, frame relay and ATM.

While the vendors tried to make the offerings appear shiny and new, many of the products are actually quite mature. Lots of them are even available. The surprising thing about these prod-

ucts is that a relatively small number of customers are using them to cut their monthly telecom costs.

Companies will spend months writing an RFP for the data network, wading through responses and cutting over a new network to save 15% on the monthly recurring costs. Yet in the overall scheme of things, this can be a drop in the bucket compared with the savings that can result from sending voice traffic over the data network.

For large companies with completely separate WAN groups for voice and data, the politics alone can be enough to make integrating voice and data nets unattractive. However, for midsize companies with a handful of locations around the coun-

try, or for companies with international sites, using the data network to carry voice traffic translates to bottom-line savings.

For example, our company is installing ACT Networks, Inc. frame relay access devices to support on-net calls among offices over our frame relay network. The estimated savings amount to approximately \$12,000 to \$15,000 a year. The data network only costs us about \$20,000 a year. The savings in voice nearly pays for the data network.

So why isn't there a mass migration in this direction, at least for midsize companies? Inertia is probably one big reason. It's easier to do things the way they've always been done. It takes time and energy to explore new options and then implement them.

There is also perceived risk. As the network manager leading this charge, you could be the hero or the fool, depending on how smoothly the implementation goes and how much money you save. The first time there is a network problem, fingers will surely point at you.



**Daniel Briere and
Christine Heckart**

Another reason companies aren't embracing voice-over-data network technology is the lack of support by the service provider community.

Don't be surprised at this. You're asking carriers to migrate from some of the bread-and-butter (and revenue-generating) voice traffic to ride "free" on the

data net. Most carriers aren't going to embrace this idea.

To many corporate decision makers, especially those with strong backgrounds in voice communications, this looks like a secret plot by the data folks to take over the telecom world.

But just because your service provider isn't pushing you to consider this option doesn't mean it isn't worth looking into, and fast. More progressive providers will be offering different priorities of service on frame relay and IP nets this year, although this certainly isn't a prerequisite to implementing voice-over-data network solutions.

Of all the ways you can choose to spend your scarce time and resources, this is one that could have a huge impact on your company's bottom line.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

TCG CERFnet lets Web servers sing in unison

By Denise Pappalardo

TCG CERFnet, a Teleport Communications Group, Inc. business unit, recently announced real-time Web server content update support for its Web hosting service that let users maintain current Web sites at multiple locations.

Web Chorus, CERFnet's enhanced Web hosting service, distributes Web site content to any of CERFnet's six primary Web hosting facilities around the country, offering Web browsers centralized access to a Web Chorus site.

ported and updated in real time.

While other 'Net service providers offer Web site mirroring or caching as part of their hosting service, CERFnet's service intelligently determines the closest Web server to a user trying to access a Web Chorus Web site. "The service required two things: One, that we have the ability to detect where the user is located and that we are able to maintain the Web site in real time," Mohta said.

CERFnet is using Cisco Systems, Inc.'s Distributed Director software on its routers to determine the location of users accessing a Web Chorus-hosted site.

Serving up updates

The ISP is also using the IBM/Transarc Distributed File System to perform real-time server content updates, according to Mohta.

Real-time server updates eliminate the need for a content developer to update each Web server manually.

Instead, the updated content is automatically sent to one or all of the primary hosting facilities.

The service is available now; pricing has not been set. Web Chorus will be priced higher than CERFnet's Web hosting service, which starts at \$6,000 per month. ■

With new software it deployed in its network, CERFnet can now support real-time updates to multiple Web servers, said Pushpendra Mohta, executive vice president at CERFnet in San Diego. CERFnet's basic Web hosting service supports users' content on a single server at its San Diego facility.

Web Chorus will support distributed Web hosting for its customers on Sun Microsystems, Inc., Unix-based and Compaq Computer Corp. Windows NT-based servers at its facilities in San Diego, San Francisco, Los Angeles, New York, Boston and Chicago.

All in real time

With this service, CERFnet customers' Web sites are sup-

DSL

Continued from page 27

work backbone.

While GTE continues its technical trials, it is also figuring out how to roll out a bulletproof service.

The company is addressing issues such as pricing, data rates, security and ways to speed Internet applications such as Web caching.

Phone companies and Internet service providers also have to prepare their networks to sup-

port the lead of US WEST, which already offers DSL at sub-T-1 speeds in certain cities in its territory.

At Interop, Pacific Bell promised to deliver services this September in the San Francisco Bay area at similar speeds.

The two flavors: 384K bit/sec in both directions, and 384K bit/sec away from the customer and 1.5M bit/sec toward the customer.

Pricing has not been set, but will range between \$70 and \$200 per month in recurring costs for

DSL PROGRESS

Recently announced digital subscriber line (DSL) product rollouts:

Company	Products	Description
Amati Communications	810 Asymmetric DSL (ADSL) modem	Maximum speed of 8M bit/sec for one direction and low power consumption
	ADSL View Manager	Carrier tool for provisioning and reconfiguring DSL networks
Alcatel Telecom	ATM-over-ADSL gear (in development)	Will license ADSL chips from SGS Thomson Microelectronics
NetSpeed	Three pieces of ADSL gear, including an inverse multiplexer	Mux can bond up to three ADSL lines for 24M bit/sec bandwidth

port the potential boom in demand for bandwidth that will come with high rates of DSL subscribers.

"The backbones are melting down as it is," Hassell said.

While the fastest DSL services may be a way off, more carriers

connecting to the Internet or a corporate network.

The monthly ISP fee would be additional, according to Pacific Bell.

And the rumors persist that Bell Atlantic will make an announcement soon. ■

Why so slow?

Meanwhile, carriers continue to learn about the practical side of rolling out DSL. GTE, for example, has developed gear to test whether any line can support DSL service.

The testing can be done from a central platform on any line designated by phone number, according to Bugs.

Ultimately, that testing capability could be put in the hands of customers. By tapping in to a GTE Web site, a customer could check, within minutes, whether a particular line was good enough and short enough to support the service, Bugs said.

Through its tests, GTE has also learned that DSL performance can be hurt by noise from ISDN and T-1 lines clustered in the same cabling with DSL lines. The solution: assign DSL lines to T-1 free cabling.

That means added expense to provision lines in a binder without any T-1s, which could affect the price competitive carriers or ISPs charge for DSL services. They would have to lease copper lines from local exchange carriers that would have to make the lines ready, presumably at some cost.

While eager customers may be getting impatient, DSL has managed to avoid the fate of ISDN, the digital dial-up technology that cannot seem to shake its reputation for being troublesome. ■

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Company _____

Address _____

City _____ State _____ Zip _____

Business phone (_____) _____

Business FAX (_____) _____

Internet e-mail address _____

If there is a parent company, please provide name: _____

1

Industry: (check one only)

- 01. Manufacturers (other)
- 02. Finance/Banking
- 03. Insurance/Real Estate/Legal
- 04. Health Care Services
- 05. Hospitality/Entertainment/Recreation
- 06. Media/TV/Cable/Radio/Print
- 07. Retail/Wholesale Trade/Business Services
- 08. Transportation
- 09. Utilities
- 10. Education
- 11. Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
- 12. Government (Federal/State/Local)
- 13. Military
- 14. Aerospace
- 15. Consultants (Independent)
- 16. Carriers/Interconnects
- 17. Manufacturers (Computer/Communications)
- 18. Resellers of Computer/Network Products (VARs, VADs)
- 19. Systems/Network Integrators
- 20. Distributors (Computer/Communications)
- 21. Other (please specify) _____

2

What is your job function? (check one only)

- NETWORK IS MANAGEMENT:
- 1. Networking Management
 - 2. LAN Management
 - 3. Datacom/Telecom Management
 - 4. IS, IT, MIS, Systems Management
- 5. Engineering Management
 - 6. Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
 - 7. Consultant (Independent)
 - 8. Other (please specify) _____

3

What is the estimated value of networking equipment and services that you help specify, recommend or approve? (check one only)

- 01. \$100 million or more
- 02. \$50 mil. - \$99.9 mil.
- 03. \$25 mil. - \$49.9 mil.
- 04. \$20 mil. - \$24.9 mil.
- 05. \$10 mil. - \$19.9 mil.
- 06. \$5 mil. - \$9.9 mil.
- 07. \$1 mil. - \$4.9 mil.
- 08. \$500,000 - \$999,999
- 09. \$250,000 - \$499,999
- 10. \$100,000 - \$249,999
- 11. None of the above

4

What is the total number of sites for which you have purchase influence? (check one only)

- 1. 100+
- 2. 50 - 99
- 3. 20 - 49
- 4. 10 - 19
- 5. 2 - 9
- 6. 1
- 7. None

5

Are you involved in the purchase of and/or plan to purchase network products and services?

Yes No

6

Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:

B. I plan to purchase the following products/services:

- LOCAL-AREA NETWORKS
- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> Local-Area Networks |
| <input type="checkbox"/> | <input type="checkbox"/> Network Op. Sys. Software |
| <input type="checkbox"/> | <input type="checkbox"/> LAN Storage/Backup |
| <input type="checkbox"/> | <input type="checkbox"/> Optical LAN Storage/Backup |
| <input type="checkbox"/> | <input type="checkbox"/> Disk LAN Storage/Backup |
| <input type="checkbox"/> | <input type="checkbox"/> Tape LAN Storage/Backup |
| <input type="checkbox"/> | <input type="checkbox"/> RAID LAN Storage/Backup |
| <input type="checkbox"/> | <input type="checkbox"/> Network Test/Diagnostic Tools |
| <input type="checkbox"/> | <input type="checkbox"/> Cables, Connectors, Baluns |
| <input type="checkbox"/> | <input type="checkbox"/> UPS |
| <input type="checkbox"/> | <input type="checkbox"/> Network Interface Cards |
| <input type="checkbox"/> | <input type="checkbox"/> Peer-to-Peer LANs |
| <input type="checkbox"/> | <input type="checkbox"/> SNMP Network Management |
| <input type="checkbox"/> | <input type="checkbox"/> ATM Switches |
| <input type="checkbox"/> | <input type="checkbox"/> Token-Ring Switches |
| <input type="checkbox"/> | <input type="checkbox"/> Ethernet Switches |
| <input type="checkbox"/> | <input type="checkbox"/> Remote LAN Access/Communications Servers |
| <input type="checkbox"/> | <input type="checkbox"/> SuperServers |
| <input type="checkbox"/> | <input type="checkbox"/> File/Application Servers |
| <input type="checkbox"/> | <input type="checkbox"/> Print Servers/Fax Servers |
| <input type="checkbox"/> | <input type="checkbox"/> CD-ROM Servers |
| <input type="checkbox"/> | <input type="checkbox"/> LAN Servers |
- INTERNETWORKING
- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> Bridges |
| <input type="checkbox"/> | <input type="checkbox"/> Routers |
| <input type="checkbox"/> | <input type="checkbox"/> Bridge/Router |
| <input type="checkbox"/> | <input type="checkbox"/> Gateways |
| <input type="checkbox"/> | <input type="checkbox"/> Intelligent Hubs |
| <input type="checkbox"/> | <input type="checkbox"/> Stackable Hubs |
- COMPUTERS/PERIPHERALS
- | A | B |
|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks |
| <input type="checkbox"/> | <input type="checkbox"/> Micros/PCs |
| <input type="checkbox"/> | <input type="checkbox"/> Minis |
| <input type="checkbox"/> | <input type="checkbox"/> Mainframes |
| <input type="checkbox"/> | <input type="checkbox"/> Workstations |
| <input type="checkbox"/> | <input type="checkbox"/> Terminals |
| <input type="checkbox"/> | <input type="checkbox"/> Printers/Network Printers |
| <input type="checkbox"/> | <input type="checkbox"/> Cluster Controllers |
| <input type="checkbox"/> | <input type="checkbox"/> CD-ROM |
| <input type="checkbox"/> | <input type="checkbox"/> Fax/Modem Boards |
- REMOTE/WIRELESS COMPUTING
- | A | B |
|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> PDAs |
| <input type="checkbox"/> | <input type="checkbox"/> PCMCIA Devices |
| <input type="checkbox"/> | <input type="checkbox"/> Wireless Data Services |
| <input type="checkbox"/> | <input type="checkbox"/> Wireless Data Equipment |
| <input type="checkbox"/> | <input type="checkbox"/> Wireless LANs |
| <input type="checkbox"/> | <input type="checkbox"/> Cellular Equipment & Services |
- INTERNET/INTRANET
- | A | B |
|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> Internet Access Service |
| <input type="checkbox"/> | <input type="checkbox"/> Firewalls/Security |
| <input type="checkbox"/> | <input type="checkbox"/> Web Servers |

- INTERNET/INTRANET (cont'd)
- | A | B |
|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> Web Browsers |
| <input type="checkbox"/> | <input type="checkbox"/> Intranet Applications/Groupware |
| <input type="checkbox"/> | <input type="checkbox"/> Search Retrieval Products (web crawler) |
| <input type="checkbox"/> | <input type="checkbox"/> Internet Development Tools |
| <input type="checkbox"/> | <input type="checkbox"/> Internet Commerce Tools |

- SOFTWARE/APPLICATIONS
- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> Network Management |
| <input type="checkbox"/> | <input type="checkbox"/> Systems Management |
| <input type="checkbox"/> | <input type="checkbox"/> Security |
| <input type="checkbox"/> | <input type="checkbox"/> Communications Software |
| <input type="checkbox"/> | <input type="checkbox"/> Terminal Emulation |
| <input type="checkbox"/> | <input type="checkbox"/> Word Processing |
| <input type="checkbox"/> | <input type="checkbox"/> Operating Systems |
| <input type="checkbox"/> | <input type="checkbox"/> Client/Server Applications Development |
| <input type="checkbox"/> | <input type="checkbox"/> Database Management/RDBMS |
| <input type="checkbox"/> | <input type="checkbox"/> Spreadsheet |
| <input type="checkbox"/> | <input type="checkbox"/> Groupware |
| <input type="checkbox"/> | <input type="checkbox"/> EDI |
| <input type="checkbox"/> | <input type="checkbox"/> E-mail |
| <input type="checkbox"/> | <input type="checkbox"/> Windows/Graphical User Interface |
| <input type="checkbox"/> | <input type="checkbox"/> Multimedia |
| <input type="checkbox"/> | <input type="checkbox"/> Graphics/DTP |
| <input type="checkbox"/> | <input type="checkbox"/> Remote Access |
| <input type="checkbox"/> | <input type="checkbox"/> Imaging |
| <input type="checkbox"/> | <input type="checkbox"/> Server Suites (Back office, etc.) |
| <input type="checkbox"/> | <input type="checkbox"/> Suites |
| <input type="checkbox"/> | <input type="checkbox"/> Middleware |
| <input type="checkbox"/> | <input type="checkbox"/> Document Management |
| <input type="checkbox"/> | <input type="checkbox"/> Database Server |
| <input type="checkbox"/> | <input type="checkbox"/> Site Metering Tools |
| <input type="checkbox"/> | <input type="checkbox"/> Computer-Integrated Telephony (CIT) |

- WIDE-AREA NETWORK EQUIPMENT & SERVICES
- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> Frame Relay Equip./Services |
| <input type="checkbox"/> | <input type="checkbox"/> Modems |
| <input type="checkbox"/> | <input type="checkbox"/> FT-1/T-1/T-3 Multiplexers |
| <input type="checkbox"/> | <input type="checkbox"/> FT-1/T-1/T-3 Services |
| <input type="checkbox"/> | <input type="checkbox"/> SONET |
| <input type="checkbox"/> | <input type="checkbox"/> Inverse Multiplexers |
| <input type="checkbox"/> | <input type="checkbox"/> SMDS |
| <input type="checkbox"/> | <input type="checkbox"/> Asynchronous Transfer Mode |
| <input type="checkbox"/> | <input type="checkbox"/> Diagnostic/Test Equipment |
| <input type="checkbox"/> | <input type="checkbox"/> DSU/CSU |
| <input type="checkbox"/> | <input type="checkbox"/> VSAT/Satellite |
| <input type="checkbox"/> | <input type="checkbox"/> ISDN Equipment & Services |
| <input type="checkbox"/> | <input type="checkbox"/> PBXs |
| <input type="checkbox"/> | <input type="checkbox"/> Voice Mail/Response |
| <input type="checkbox"/> | <input type="checkbox"/> Videoconferencing |
| <input type="checkbox"/> | <input type="checkbox"/> Leased Lines |
| <input type="checkbox"/> | <input type="checkbox"/> Switched Data |
| <input type="checkbox"/> | <input type="checkbox"/> E-mail |
| <input type="checkbox"/> | <input type="checkbox"/> 800/900/MTS Services |
| <input type="checkbox"/> | <input type="checkbox"/> Virtual Networks |
| <input type="checkbox"/> | <input type="checkbox"/> Outsourcing/Systems Integration Services |
| <input type="checkbox"/> | <input type="checkbox"/> Education/Training Services |

10. None of the above (1-99)

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7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:

B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS

- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> SNA |
| <input type="checkbox"/> | <input type="checkbox"/> DECnet |
| <input type="checkbox"/> | <input type="checkbox"/> TCP/IP |
| <input type="checkbox"/> | <input type="checkbox"/> Novel IPX/SPX |
| <input type="checkbox"/> | <input type="checkbox"/> APPC/APPN/LU 6.2 |
| <input type="checkbox"/> | <input type="checkbox"/> NETBIOS |
| <input type="checkbox"/> | <input type="checkbox"/> AppleTalk |
| <input type="checkbox"/> | <input type="checkbox"/> NFS |
| <input type="checkbox"/> | <input type="checkbox"/> 1Pv6 |
| <input type="checkbox"/> | <input type="checkbox"/> SNMP/SNMPv2 |
| <input type="checkbox"/> | <input type="checkbox"/> Other (please specify) _____ |

LAN ENVIRONMENT

- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> 4M Token Ring |
| <input type="checkbox"/> | <input type="checkbox"/> 16M Token Ring |
| <input type="checkbox"/> | <input type="checkbox"/> Ethernet |
| <input type="checkbox"/> | <input type="checkbox"/> Fast Ethernet |
| <input type="checkbox"/> | <input type="checkbox"/> 100VG Any LAN |
| <input type="checkbox"/> | <input type="checkbox"/> FDDI |
| <input type="checkbox"/> | <input type="checkbox"/> LocalTalk |
| <input type="checkbox"/> | <input type="checkbox"/> 10Base-T |
| <input type="checkbox"/> | <input type="checkbox"/> ATM |
| <input type="checkbox"/> | <input type="checkbox"/> Other (please specify) _____ |

NETWORK OPERATING SYSTEM

- | A | B |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> Microsoft (LAN Manager) |
| <input type="checkbox"/> | <input type="checkbox"/> Novell (NetWare 2.X, 3.X) |
| <input type="checkbox"/> | <input type="checkbox"/> Novell (NetWare 4.X) |
| <input type="checkbox"/> | <input type="checkbox"/> Windows NT |
| <input type="checkbox"/> | <input type="checkbox"/> Windows NT/Advanced Server |
| <input type="checkbox"/> | <input type="checkbox"/> LocalTalk (AppleTalk) |
| <input type="checkbox"/> | <input type="checkbox"/> Banyan (VINES) |
| <input type="checkbox"/> | <input type="checkbox"/> IBM (LAN Server) |
| <input type="checkbox"/> | <input type="checkbox"/> IBM (PC LAN Program) |
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| <input type="checkbox"/> | <input type="checkbox"/> Digital (Pathworks) |
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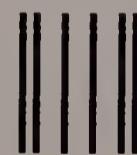
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Intranet Applications

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Briefs

Internet Security Systems, Inc. (ISS) has unveiled RealSecure NT 1.0, software that monitors a network and searches for attack patterns and unauthorized activities carried out on Web, File Transfer Protocol or E-mail servers. Priced at \$4,995, the software is scheduled to ship next month.

© ISS: (800) 776-2362

O'Reilly & Associates, Inc. this summer plans to ship WebSite Professional 2.0, a developer's kit that includes a package called Web-

 Site. Servlet for creating server-side Java applications based on Sun Microsystems, Inc.'s Java Development Kit 1.1.

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Cruise Technologies, Inc., of Arlington Heights, Ill., last week unveiled CruiseConnect, client and server software that enables thin clients to communicate over wireless networks. The software substitutes for an operating system in a handheld device, letting users access Windows applications running on a remote server. The software is aimed at campus-style wireless nets. Cruise works with OEM partners, and Wyse Technologies, Inc. was the first to license the software for an upcoming wireless version of its Win-term product.

© Cruise: (847) 797-0520

Pine Cone Systems, Inc., a Boulder, Colo., start-up, has unveiled a set of four products aimed at managing and maintaining data warehouses. The products let managers monitor and charge back for warehouse usage, continually check data quality and load data. The products are available separately or as a package. Prices range from \$7,500 to \$60,000.

© Pine Cone: (303) 221-4000

Push technology

Customers not moved by push

But users see potential benefits of the new information distribution technology.

By Carol Sliwa

While the concept of broadcasting applications and Web pages over intranets and the Internet remains a hot topic of discussion, users say they are not quite ready to take the plunge into push technology.

"We've thought about it a lot, and we've done a lot of tests and experiments, but we just haven't decided what to do yet," said Malcolm Kirby, manager of the Office of the Intranet for Xerox Corp. in Rochester, N.Y.

Reached at NetWorld+Interop 97, Kirby discussed the prospect of using the technology to notify employees of changes in content that interest them, or even to distribute software.

But, he said, the best solution might be a neutral form of multicasting, whereby a single stream of data can be sent efficiently to multiple IP addresses.

"What we've concluded so far is that there is a lot of hype," Kirby said. "The marketplace is in complete turmoil right now, and it will be for a few months. There are too many new products, and the core technology model really hasn't emerged yet," he added.

Microsoft, Netscape duke it out

The battle between Microsoft Corp. and Netscape Communications Corp. has given many potential push users cause for concern.

Microsoft is promoting the Channel Definition Format (CDF), based on Extensible Markup Language, as a standard way for delivering content to end users' desktops. Netscape, on the other hand, claims that HTML, Java and JavaScript are all anyone needs.

If the vendors cannot reach a compromise, customers will be left preparing content in two different ways if they want to broad-

cast information in both environments.

"From an end-user perspective, I like the [push] concept, but you don't like feeling as though you're being forced to choose between potato and potahito," said John Swartzendruber, senior information consultant of advanced technologies for Eli Lilly and Co. in Indianapolis. "It would be nice to be able to implement a single solution."

Like many corporations, Lilly watched hordes of employees get hooked on the push concept through PointCast, Inc.'s popular PointCast Network, which

delivers news updates on a specified schedule to end users' desktops when their screens are idle. Lilly even had to install a separate proxy server to handle the PointCast load.

But, as a Netscape user, Lilly may want to take advantage of Marimba, Inc.'s Castanet tuner technology, which will come bundled with Netscape's new Communicator client.

The tuner technology will push company information to end users' desktops via Lilly's intranet or receive content from external providers over the Internet, Swartzendruber said. Marimba falls into the Netscape camp, and PointCast has allied with Microsoft's CDF.

Get more online:

- Downloadable copies of push clients
- Vendor white papers on the technology
- Comparisons of impending push clients from Microsoft and Netscape

NetworkWorld

Fusion



"It seems like it's the software equivalent of installing a red phone and blue phone on people's desks, and that's frustrating," Swartzendruber said.

A major automotive manufacturer said it is comfortable with a multiple browser strategy, given that it has loyal users of Netscape and Microsoft browsers.

Its only dilemma is finding a good business case for push, according to a technologist with the company.

Lilly, on the other hand, foresees plenty of practical uses.

See Push, page 31

Cyber cops

Belgian police turn to the 'Net to hunt down suspected crooks

By Ellen Messmer

Brussels, Belgium

In a child kidnap and murder case that exploded here last August, Belgium's high-tech police say they are closing in on a child-pornography ring that used the Internet to lure teenagers and distribute kid-porn for profit.

Two suspects are already in custody in the case that began when police found two children held hostage and another two dead in the cellar of a suspect, Marc Duthroux, in the Belgian town of Sart La Bussiere.

As the investigation proceeded, police happened to search the computer of one of Duthroux's associates, suspected porn distributor Michel Nihoul.

In Nihoul's computer, police discovered a cache of Usenet logs, recorded chat sessions and E-mail addresses — all clues

pointing toward a crime ring operating on the 'Net.

"We saw there were links to the Internet," said Freddy Gevaert, director of the Belgian state police, who said officials hope to soon wrap up an investigation that will net more child pornography merchants and their customers.

Police also think the group may be involved in fraud and racketeering.

This is Belgium's first criminal case conducted on the 'Net, and it has led to a widespread call for more police action to solve the case and crack down on child exploitation.

Belgian authorities have set up a Web site (www.gpj.be) to ask for the public's help in tracking down missing children and to receive tips about suspected pornography dealers.

Leading Belgium's 25-agent

computer crimes division on the case is Inspector Roland Walraet of the Belgium Judicial Police.

Like Inspector Javert in the Victor Hugo classic, *Les Misérables*, Inspector Walraet is fiercely pursuing every lead.

Armed with network sniffers and data-recording equipment, the cybersleuths are monitoring Internet relay chat groups and Usenet groups such as alt.sex.pedophilia and alt.binaries.pictures.erotica.

One challenge, Walraet said, is determining whether an Inter-

This is Belgium's first criminal case conducted on the 'Net, and it has led to a widespread call for more police action to solve the case and crack down on child exploitation.

net user is Belgian or a resident of Belgium.

If not, Belgian officials cooperate through Interpol, the

See Belgium, page 33

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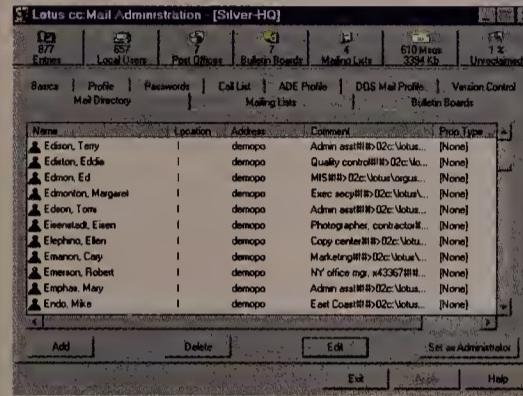
Lotus gives cc:Mail an Internet boost in Version 8

New release adds support for Post Office Protocol 3 and a host of other Internet standards.

By Paul McNamara

Cambridge, Mass.

Lotus Development Corp. last week released cc:Mail 8, the latest version of its workhorse E-mail product that some industry watchers have speculated may soon be phased out in favor of the company's flagship Lotus Notes/Domino offerings.



In the latest release of cc:Mail, Lotus provides a number of features that will ease the administration load for managers, company officials said.

Lotus insists it has no plans to phase out cc:Mail but does encourage customers to migrate from cc:Mail to Notes.

With the addition of Internet E-mail standards and features that simplify administration, Lotus officials said they are aiming to satisfy cc:Mail's installed base of 12 million customers and also appeal to smaller businesses that are only now deploying E-mail.

The upgrade includes support for Post Office Protocol 3 (POP3), Internet Message Access Protocol 4, Lightweight Directory Access Protocol and Multi-purpose Internet Mail Extensions (MIME). Lotus also announced the release of Lotus Mail

4.5, a POP3 mail client that comes bundled with cc:Mail.

Back-end cc:Mail enhancements include a Windows-based administration program that lets managers view their complete cc:Mail network, a Simple Mail Transfer Protocol/MIME gateway, and the Windows NT Server-based cc:Mail Router.

Tom Delaney, a cc:Mail manager at an international pharmaceutical company, said he has little use for Internet mail but is pleased about the new router and administration tools. "The [router is] going to allow us to do 25 simultaneous TCP/IP connections, as well as eight simultaneous [ATM] connections," he said. "That just gives us a tremendous amount of flexibility in terms of what we can do with our mail."

Despite frequent assurances from Lotus that it intends to continue to develop cc:Mail, rumblings have persisted that the product is on its last legs.

"Our focus here is to converge [Lotus] Notes and cc:Mail, not to kill cc:Mail," said Larry Jones, director of product marketing for Lotus messaging. "[We're

"The [router is] going to allow us to do 25 simultaneous TCP/IP connections, as well as eight simultaneous [ATM] connections," one user said.

"That just gives us a tremendous amount of flexibility in terms of what we can do with our mail."

going] to let the market tell us what to do with cc:Mail, and when the market is telling us it's growing by 20% or 25% per year, those are good numbers."

At least one industry analyst believes Lotus has set the right course for cc:Mail. "They've given people reasons to stick with cc:Mail a little bit longer," said Brad Harding, a research analyst at Ferris research, Inc. in San Francisco.

Available now, cc:Mail costs approximately \$55, depending on volume.

© Lotus: (617) 577-8500

Push

Continued from page 29

The pharmaceutical company envisions delivering corporate-generated information to all desktops. And Lilly's scientists located in different parts of the world may want to push out research information to each other to stay current in their fields.

In the same way, the Mayo Clinic in Rochester, Minn., wants to push research information over its intranet to physicians in different specialties.

The clinic also would like to see screen savers in physician offices deliver information to patients in waiting rooms.

"We aren't sure exactly how it's going to be implemented yet," said Brian Kaihoi of the Mayo Clinic's Information Services department, noting that his company is currently testing home-

grown technology.

Schlumberger, Ltd., an international oil field service and manufacturing organization, set up a trial system in its oil stimulation division with PointCast's I-Server.

The eventual goal is pushing financial information generated with Server Advertisement Protocol software, personnel

"We've decided more or less to keep watching [push technology] and do nothing until there's some kind of calmness in the market."

David Sims, technical manager, Schlumberger

data, safety alerts and equipment updates to end users' desktops.

"We've decided more or less to keep watching [push technology] and do nothing until there's some kind of calmness in the market," said David Sims, a Sugar Land, Texas-based technical manager for Schlumberger. "Then you can make an intelligent decision." ■

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Responsibilities of the creators

Nobert Wiener was a bit optimistic (or was that pessimistic?) when he wrote in his 1964 book, *God & Golem, Inc.*, that "within from ten to twenty-five years, chess machines will have reached the master class, and then, if the efficient but somewhat machine-like methods of the Russian school have allowed chess to survive so long, it will cease to interest human players."

It has been 33 years between the publication of this very interesting little book — still available from MIT Press — and its mention of an IBM-developed checkers program that "appears to learn from its experience," and the victory of IBM's latest game-playing computer, Deep Blue, over the world chess champion.



Scott Bradner

While I rather doubt chess will suddenly become uninteresting to humans, this event seems to be causing quite a bit of upset. The vision of a malevolent, self-aware computer such as HAL, who recently celebrated a birthday, seems to loom large in the minds of too many people — a creation turning against its creator.

In light of some of the recent news, I expect some of the Internet's creators might also harbor some worries along this line.

At the same time that Bob Kahn and Vint Cerf are to be awarded the National Medal of Technology, and the Federal Communications Commission is ordering low-cost Internet connections for schools and libraries, Germany is about to approve the establishment of an Internet police to look for things on the 'Net that offend German law.

The French government is suing a Web

site because it does not have a French language version. The U.S. Social Security Administration is putting all of our employment records up for easy access on the 'Net.

The U.S. government complains that European privacy protection laws are getting in the way of commerce and maintains that certificate authorities have to know your private key in order to function.

The National Science Foundation inspector general recommends that the U.S. government take over managing the International Internet name space and make it a profit center.

The purveyors of unsolicited E-mail, advertising everything from Ponzi schemes to online pornography, publicly boast of their ability to push their garbage into everyone's faces and claim to have the constitutional right to do so. The spreaders of hate seize yet another vehicle to distribute their venom.

In general, the creators of the Internet did not intend it to be a weapon against the individual or society...

In this case it is not the creation which is at fault, but instead those who would exploit the Internet for their own gain at the expense of everyone else, those who fear its unfettered pathways, the clueless and those who would use this tool as yet another weapon.

In general, the creators of the Internet did not intend it to be a weapon against the individual or society, they intended it

to support communication, which, on balance, is better to have than not have.

Wiener noted, "The Social Sciences are a bad proving ground for the ideas of cybernetics."

But it is in these arenas that we now must strive to decrease the threat and increase the promise of what we are creating.

Disclaimer: Harvard's creations (graduates) are always promise and never threat, so the above exhortation must be my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.

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Belgium

Continued from page 29

international police agency, to share evidence with other countries, including the U.S.

Another challenge is getting cooperation from Internet service providers. "We've asked Internet service providers not to carry the newsgroups containing child pornography," Walraet said.

To offer access to the newsgroups, an ISP has to download messages to a network server. In the eyes of the Belgian police, the ISP is, therefore, in possession of illegal material and could be prosecuted.

Some of the U.S.-based ISPs operating in Belgium, such as UUNET Technologies, have complied with the request to drop the pornography groups that the Belgian police had specified, Walraet said. But many of the smaller Belgian ISPs still defiantly carry the material, often in the

name of "freedom of speech," he added.

Because it is difficult to manually monitor the Internet, the Belgium Judicial Police have developed Internet robots that scan newsgroup messages based on automated searches of character strings and other information.

Going robotic

The robot programs, dubbed the Cyber Order Patrol, can create a database with the names of graphic files containing pornography. The database has helped in searches of suspects, and the police are counting on it to create a body of evidence that can be presented in court to obtain convictions.

Walraet said law enforcement divisions in countries across the globe need to work closely to combat the crime of child pornography. "Only if solid international agreements and procedures will be made, will it really be possible to fight the problem," he said. ■

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Internet dither

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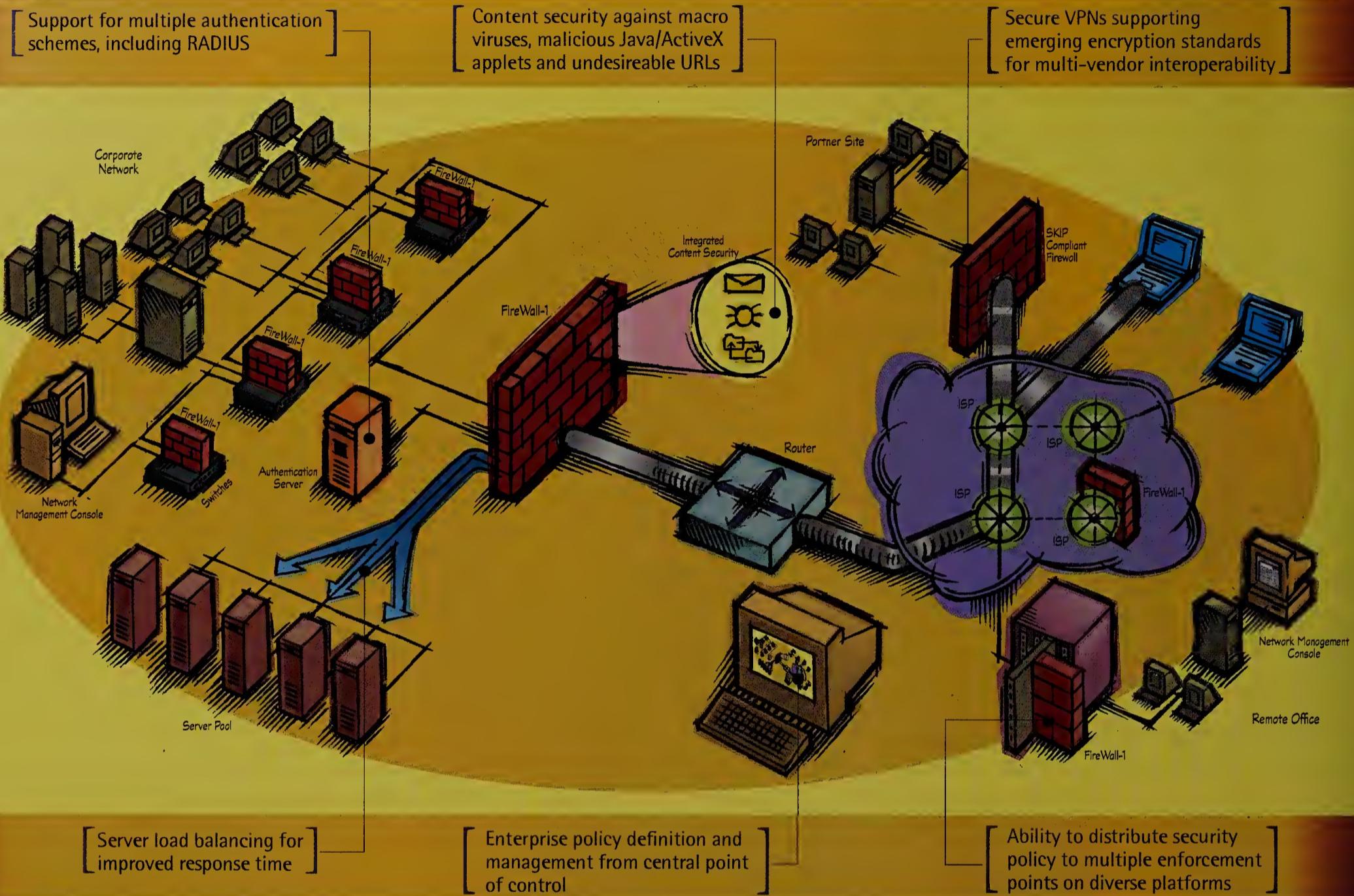
Page 24.

Also inside

- Fidelity is all business
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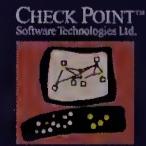
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IntraNet

May 1997
Volume 2, Number 5

FEATURES •

14 Pure business

A fundamental transformation is under way at Fidelity Investments, and Web technology is the driver. The mutual fund giant is building an intranet-centric information architecture anchored by a huge data warehouse and a host of decision-support tools.



Fidelity's Timothy Davis is opening the information flood gates.

22 Legal limbo

Before you plaster that depiction of Dilbert on your intranet, you'd best check with your corporate attorneys. They can offer advice on how to keep your intranet out of the courts.

24 COVERT Directory dither

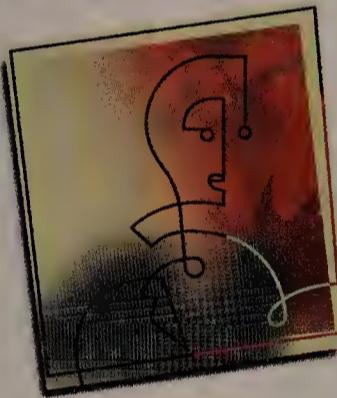
If only getting rid of the headache brought on by the exploding intranet and the need to integrate directories were as easy as popping a couple of Tylenols. Illustration by Rich Borge.

28 Seeing into the future: Videoconferencing on your intranet

With cost and other obstacles out of the way, desktop videoconferencing may very well become an intranet fixture.

30 IBM NCs and the intranet

Network computers have come to market with more than the usual share of bigotry and bashing. Bob Dies, general manager of IBM's Network Computer Division, cuts through the hype in this Q&A.



DEPARTMENTS •

Hot Links 5

Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet.

IntraNet Handbook: JavaScript 6

Get the skinny on this scripting language — it's easy to use and results in rich pages.

Ask Dr. IntraNet 6

The doctor weighs E-mail gateway and ISDN access options.

Product Watch: Webcasters push into intranets 10

Things are getting "pushier" by the day out there, as vendors



tune their broadcast/subscribe products to the needs of intranets.

Review: HNS' DirecPC Commercial 12

Satellite access to the company intranet? Why not? HNS delivers a decent option with its DirecPC Commercial VSAT service.

IntraVert: Setting the Social Scene 35

Social conventions litter our everyday lives, but the intranet creates its own setting and demands different social skills.

From the Editor

With each URL flashed during a TV commercial, the concept of networking creeps farther outside the confines of our offices and data centers. It is, by this point, pervading the lives of our laymen friends and family.

People are catching on to just how dynamic, interesting and critical networking is to America. From my college roommate to the cop down the block, it seems every day I hear of someone else who's decided to shift employment gears and head into networking.

Within companies, the intranet is driving this phenomenon. Networking seems so easy when it's front-ended by a user-friendly browser that brings anything you want to your desktop.

For IT managers, this can mean greater respect from people at either end of the corporate personnel chain: Departmental managers who look your way to help them launch Web-based initiatives for specific business tasks, and top executives who count on you to reduce costs and put information in the hands of the front-line troops.

As intranets pass beyond the first generation of static publishing and into the second, third and even fourth generations of dynamic, interactive applications, IT managers will find even more responsibility being piled on their shoulders.

So set those shoulders square and get ready for the burden brought on by the revenue-generating, business-enhancing, customer-critical applications headed for your intranet. The applications will succeed only if you make sure the network stays as transparent as ever.

Beth Schultz, executive editor (bschultz@nww.com)

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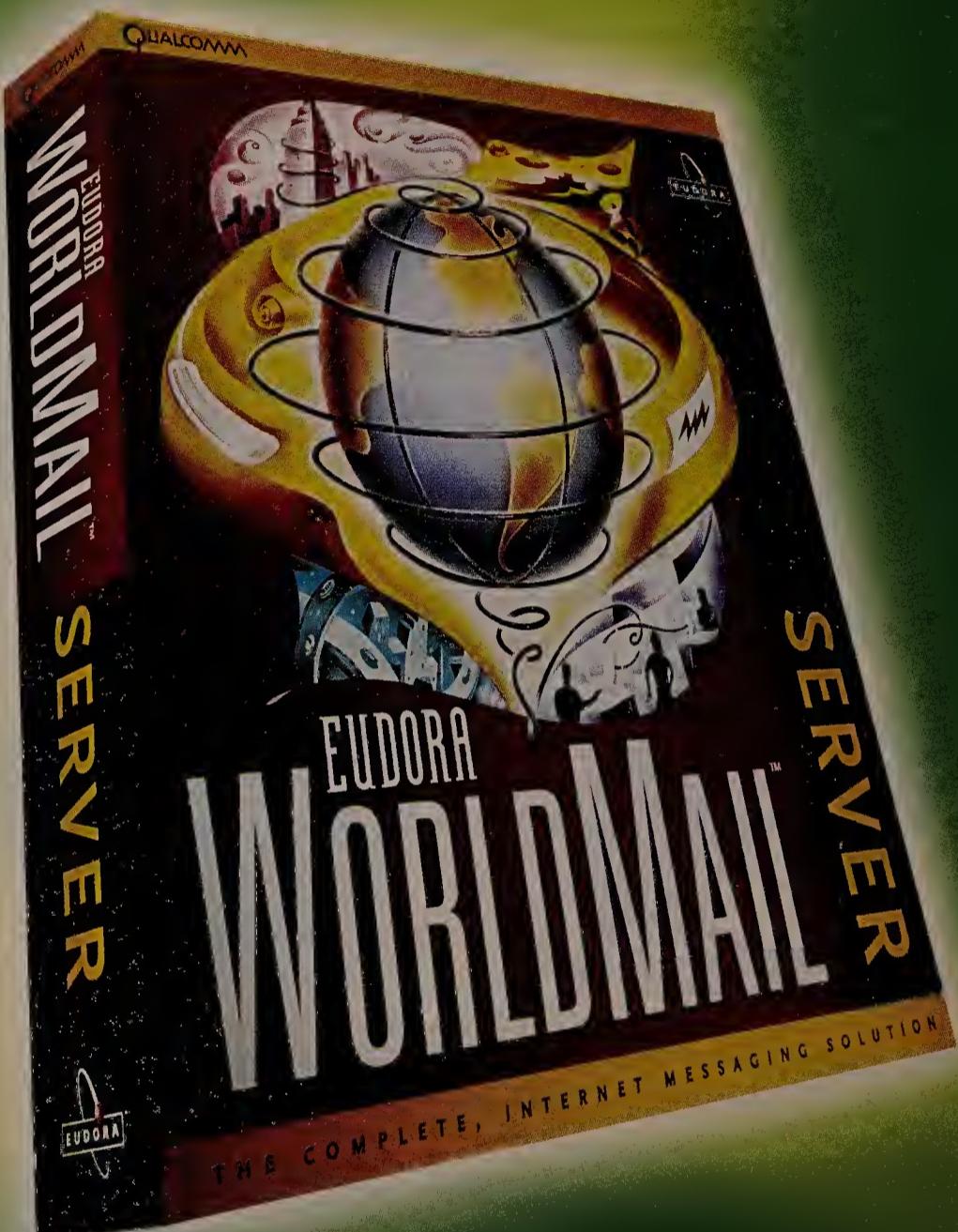
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Learning from others' mistakes

IT managers about to embark on an internal Web project might want to grab a copy of a new Intranet Institute booklet on the 10 most common mistakes made by trailblazing intranet developers. The booklet's content comes from thousands of early users, says John Clio, president of the educational organization. Here's the list:

Mistake 1: Focusing intranet development resources on the wrong applications.

The advice: Deploy intranet applications for completing business transactions.

Mistake 2: Underestimating the support required in thin-client environments.

The advice: Invest in well-planned browser support.

Mistake 3: Solving only half the security problem.

The advice: Don't stop at the firewalls and passwords; involve management.

Mistake 4: Building an intranet application on an unfinished object architecture.

The advice: Build the application without the unfinished model, then reevaluate it when the model is completed.

Mistake 5: Rolling your own database systems.

The advice: Focus on building applications instead.

Mistake 6: Relying on two- or three-tier intranet architectures.

The advice: Deploy a fourth tier between the application or database servers and the users.

Mistake 7: Underestimating network capacity requirements.

The advice: Gain agreement that management will be supportive when the need for more capacity arises.

Mistake 8: Underestimating the extensiveness of system and network management tasks.

The advice: Look to traditional systems management techniques used in host environments to ensure round-the-clock application availability.

Mistake 9: Failing to maintain currency.

The advice: Make information updating a team responsibility.

Mistake 10: Selecting the wrong leadership chain.

The advice: Involve a respected nontechnical driver who can minimize turf wars and act as an arbitrator.

From Deep Blue to your intranet

What can your intranet site have in common with highly trafficked Web pages for events such as the Deep Blue chess tournament and recent Masters golf tournament? Well, if you use IBM's Interactive Network Dispatcher, it'll be the ability to handle millions of hits per day without missing a beat.

Interactive Network Dispatcher runs on any back-end server with an operating system that has a configurable TCP stack. That server sits in front of a cluster of Web servers, providing a single IP address to users. The software uses dynamic weighting to distribute traffic among the servers.

IBM expects intranet managers to use the software for maintaining sites that support revenue-generating or business-critical programs, says Earl Mathis, product market-

HEAVY HITTERS

IBM's Interactive Network Dispatcher has proven itself on the Web. Here's a sampling of some of its hardware.

Site	Statistics
1996 Summer Olympics	18 million hits on the busiest day
1997 Masters	More than 12 million hits per day
Netscape's home page	More than 40 million hits per day

ing manager. "This is not just a traffic story; it's an availability story."

IBM has offered Interactive Network Dispatcher on the AIX platform since last fall, and last month announced availability for Windows NT and Solaris. The software costs \$1,500 per Web server.

Intranets in India?

Digital Equipment Corp. and Microsoft Corp. are taking their intranet-building partnership to India, where they're opening "proof of concept" centers in 10 cities to show the usefulness of Web technology.

Netscape Communications Corp. isn't just sitting by; the rival firm recently appointed a director of business development for India.

It hasn't yet opened an office in India, but the company is working with distributors there.

"The India market is blossoming," says Chris Fell, director of international research for International Data Corp. (IDC), a market research firm in Framingham, Mass.

In fact, IDC expects that, by the year 2000, India will move from 21 to 14 on its list of

the top 55 worldwide IT markets. IDC projects the Indian IT market will increase from \$2.3 billion in 1995 to \$8 billion in 2000.

PC equipment purchases are expected to account for about one-half those figures, and software licenses are projected to grow from about 5.5% of IT spending to 10%, Fell says.

Load up those intranet servers

Survey shows Web servers can keep up with their collaborative counterparts.

Intranet server loads are comparable to those for collaboration products, but much less expensive, says market research firm Creative Networks, Inc.



In a survey of 52 corporations with 5,000 or more users, Creative Networks found that 5,905 users link to 22 Web servers, for a per-server average of 268 users. This compares to per-server ratios of 150 to 250 users for collaborative applications such as Lotus Development Corp.'s Notes.

The benefit comes with the costs. The companies surveyed reported a median cost of approximately \$25,000 per Web server, or \$26.50 per user per year, assuming three and a half years of use. This figure includes the Web server hardware, software and setup costs. The Palo Alto, Calif.-based firm earlier pegged client/server messaging costs at \$29.09 per user per year.

JavaScript: Dressing up Web pages with ease

BY MARK GIBBS



hen you want to create sophisticated, user-aware intranet pages you have two choices. You could go down a high-tech route with software such as Macromedia, Inc.'s Shockwave or, for a simpler approach, use one of the scripting languages.

Products like Shockwave are effective but carry a lot of overhead — not only in learning, but also in resources required. Even a basic Shockwave presentation requires approximately 100K bytes. It would be overkill to use Shockwave for form generation and input validation on a simple Web page, for example.

What you need is a scripting language that offers low overhead and high functionality. You could use scripting languages such as Digital Equipment Corp.'s Tel/Tkl or the public domain language Python, but these require plug-ins that could give you an administrative headache. JavaScript is the best bet for users of Netscape Communications Corp.'s Navigator or Communicator or Microsoft Corp.'s Internet Explorer.

JavaScript is a scripted language. That is, JavaScript programs are written using plain text, which is interpreted at run-time. This makes it easy to create and test programs. Even so, JavaScript is a rich, complex language. (It is not, as is often thought, a derivative of Java. The two have some attributes in common, but they are, at best, distant cousins.)

The scripting language made its debut in Navigator 2.0, almost as LiveScript. But Netscape ditched that name when it teamed with Sun Microsystems, Inc. and brought in the Java angle.

By changing the name to JavaScript, Netscape could capitalize on and draw an association with Java and its popularity. This ploy has served Netscape and Sun well by forcing a market standard that even Microsoft has had to follow with its JScript.

JavaScript, because it's only about a year and a half old, is a moving target. The various Navigator and Internet Explorer releases support dif-

ferent versions of JavaScript. For example, Navigator 2.0 supports JavaScript 1.0 while Navigator 3.0 supports Version 1.1, which introduced better array handling and complex data types. Communicator will offer JavaScript 1.2, in which a number of features, such as support for string searching using regular expressions, are expected.

Needless to say, Netscape's and Microsoft's implementations differ, too.

All these differences mean potential incompatibilities. So be forewarned: If you build complex JavaScript applications, you may have to do some serious engineering to accommodate the fixes and enhancements in the next vendor release.

The JavaScript skinny

So what exactly is JavaScript? Simply stated, it's a lightweight interpreted language with basic object-oriented functions.

JavaScript is lightweight because it doesn't have a strong typing and semantic architecture. It's interpreted because, like many versions of BASIC, programs are stored as plain text that a run-time system reads and executes.

JavaScript's advantage as an interpreted language is that the correctness of the source can be determined. Undesirable actions, such as writing to local storage and communicating with nonauthorized IP addresses, can be prevented. On the downside, JavaScript gets hit with a performance penalty because a lot of processing cycles are required for the on-the-fly conversions of source code to machine code needed with an interpreted language.

The language is object-oriented because it treats windows, the status bar and other elements of the browser and network environment as objects in a hierarchy that can be manipulated by name.

JavaScript code is implemented by embedding JavaScript statements in the body of Web pages written in HTML. For example, the following program creates a button that, when clicked,

See Handbook, page 9

JAVASCRIPT PRINT RESOURCES

Title	Author	Publisher	Ordering information
JavaScript Essentials: Creating Interactive Web Applications	Jason Manger	Osborne/McGraw-Hill	(800) 227-0900; ISBN: 0-07-882234-3
JavaScript By Example	Stephen Feather	Que	(800) 716-0044; ISBN: 0-7897-0813-2
JavaScript: The Definitive Guide	David Flanagan	O'Reilly & Associates	(800) 889-8969; 1-56592-234-4, Order No.: 2344
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ASK DR. INTRANET



Please step in and lie down, Steve Blass is in for consultations. He understands the stresses and strains felt by people developing and managing intranets, and is here to help. Send your problems to dr.intranet@paranet.com.

If I want an intranet E-mail gateway, does that mean I can only support the lowest common denominator message types supported by my E-mail clients?

No, it doesn't — well, it shouldn't. In fact, rather than retreating to the lowest common denominator message types, consider building on the greatest common factor transfer mechanisms — the Simple Mail Transfer Protocol.

Most major E-mail packages support some SMTP gateway functionality, and most encode and decode attachments reasonably well. The difficulty of creating a gateway from one proprietary E-mail system to another can be reduced by implementing two proprietary SMTP gateways.

I can sense the rising bile of users on sites with SMTP gateways and continuously mangled mail attachments. In the Unix world, source code for TCP/IP tools is freely available, giving me hope. It doesn't make the mail go through, but you can entertain the thought of fixing it. Look for inspiration at <ftp://ftp.uu.net/networking/mail>.

Perhaps a better way to implement E-mail gateway functionality on an intranet is to educate users to embed hyperlinks, not attachments. This will curb bandwidth consumption, reduce storage space and make distributing revisions easier.

How does ISDN play into the fray, and how do we get sufficient bandwidth to remote users who want to use our intranet?

The doctor senses a bit of schizophrenia here. Is this one question or two, or possibly three? I'll simply treat it as one question about using ISDN for intranet access.

The basic residential ISDN service provides two 64K bit/sec "B" channels for data or voice and one "D" channel for signaling, so you'll get plenty of bandwidth for intranet access. However, ISDN might bring on a headache. Problems persist with equipment compatibility, telco support and tariffs.

Depending on where users are, the cost of getting in the game can be exorbitant.

For the user equipment alone, the cost can easily be between \$200 and \$300 per installation. And the cost of ISDN access is a moving target. Because it varies by location, it's hard to make blanket recommendations for or against ISDN.

Blass is intranet services technology leader at Paranel, Inc., a systems integrator in Houston.

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Named Editors' Choice Internet Service Provider 1995, *PC Magazine*.

Founding Organizational Member of the Internet Society.

References:

Thirty-seven of the Fortune 100 companies, as well as thousands of forward-thinking medium and small companies, including: American Airlines, American Medical Management, Austin International, KP Group and SkyTel.

Hobbies:

Street hockey. Softball. Surfing the Net. Chess.

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Circle Reader Service #3

Handbook, continued from page 6
puts a message containing the date and time in the browser's status bar:

```
<html>
<head>
<script language="JavaScript">
<!--
function statbar(txt) {
  DateObj = new Date()
  window.status = txt +
DateObj.toLocaleString();
}
// -->
</script>
</head>
<body>

<form>
<input type="button" name="set"
value="Write!" onClick="statbar('The date and
time is ');">
</form>

</body>
</html>
```

The function "statbar" takes a single argument — the text specified in the function call — appends the current date and time in the locally defined format and prints them to the status bar.

This program shows a few of JavaScript's interesting aspects. First, enclosing the functions in comments ("<!--" to "-->") allows browsers that don't support JavaScript to read the page without causing errors. The page simply does nothing in the comments.</p>

Grab more info online, including:

- The JavaScript spec
- JScript documentation
- Sample JavaScript programs

www.nwfusion.com

JavaScript's object orientation can be seen in the use of the function "new" to create a new instance of an object ("DateObj") representing the current date and time. We can create the required formatting of the date and time data by referring to the new object and one of its methods — "toLocaleString." This method, in effect, is a standard function that is part of the definition of a specific object type.

The "onClick" statement illustrates the event-driven nature of JavaScript. Objects such as form fields can have different associated events cause the execution of different procedures. For example, moving the input cursor to a different field, called "onBlur," could cause updates to other fields.

Securing JavaScript

As with any technology or language on an intranet, security is a prime concern. JavaScript, while by no means the most secure of languages, is nonetheless adequate for most purposes.

First, a number of features are left

out of the JavaScript language because they implicitly compromise security. In JavaScript, for example, you can't perform any kind of operation with local files so programs can't modify or access user data. In addition, the language doesn't support any networking primitives. It can't, for example, directly open a TCP/IP socket. It can only cause URLs to be loaded and form data

submitted to Web servers.

Similarly, JavaScript implementations simply disable certain functions to fix a number of complex "gotchas." For example, the method "submit" is not allowed to cause submission of a "mailto:" URL. This is so a script can't create an empty form, mail it to any server and reveal the user's E-mail address.

In Navigator 3.0 and beyond, Net-

scape implements "data tainting," an advanced but still unproven security technique. Data tainting allows the privacy of data values to be established and controlled so the data that JavaScript programs can access is limited.

JavaScript is a fascinating technology. It has the elegance and power to make your intranet pages smarter and more effective, at a low cost. ☐

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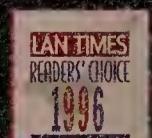
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Circle Reader Service #1

Webcasters push into intranets

BY PEGGY WATT

things are getting "pushy" out there.

Since we last looked at push, or as it's properly called, broadcast/subscribe technology (*Intranet*, Jan. 20, page 17), the number of these Web products has at least doubled. However, only a few are tuned to the needs of intranets.

Microsoft Corp. and Netscape Communications Corp., for example, joined the field last month with Channel Definition Format (CDF) and Netcaster, respectively. While CDF relies on Microsoft's Active Desktop technology, Netcaster (formerly Constellation) is based on Java.

Now third-party developers are scrambling to accommodate these competing implementations and still differentiate their products with added intelligence, such as filters and display options.

Users are moving cautiously among all this Webcasting activity.

PUSHY BUSINESS
An International Data Corp. survey found 57% of browser users in medium and large businesses have tried push technology, although 80% of the applications involved Internet Webcasting.

SOURCE: IDC, FRAMINGHAM, MASS.

Just the Facts

"There's a lot of interest, but not a widespread adoption," says Ira Machecky, analyst with Giga Information Group, Inc. in Santa Clara, Calif.

Machecky says he's seeing more enterprise control products, or broadcasting products managed at the network server, that are well-suited to internal Web sites.

"Enterprise push tries to reinstate some IT control, because IT managers have to protect and preserve the network," Machecky says.

The other intranet-oriented use of Webcasting technology is software distribution. Marimba, Inc. is targeting that market and has partnered with other vendors, notably Netscape, to add a software distribution function to their push products — but that's for another report.

Too pushy for intranets?

Despite the growing intranet thrust, corporations shouldn't get too pushy with their employees, declares self-described Webcast skeptic Michael Rudnick, a principal with Cognitive Communications, Inc., a Web consulting firm in New York.

"The way push is being touted, as the lazy man's cable, goes against the main selling point of intranets, which is letting employees share information, collaborate and move information up and down the chain," Rudnick says. "I understand why Time-Warner would want to push to the customer, but why would a corporation want to push to employees?"

Nonetheless, broadcast/subscribe technology

has clearly found a job on some intranets.

Chris Garland, systems developer consultant with First Union National Bank in Charlotte, N.C., installed Inter-mind Corp.'s Communicator to send problem reports and general information to a team of technical support engineers. The clients poll a workgroup Web server every five minutes to grab status information, and the engineers can broadcast update messages.

"It's not real-time, but it's close enough for us," Garland says.

However, the support team's Communicator is the only broadcast/subscribe product on First Union's 5,000-user network. The concern is bandwidth, Garland says.

Communicator 1.5 is intended to handle frequent polling of a few sites by a workgroup of users, says Matt Highsmith, vice president of marketing at Intermind in Seattle. A new wizard feature lets users designate which status changes prompt an alert; its broadcasts now support multimedia.

Intermind is one of several early developers who first targeted Internet broadcasting. Like Astound, Inc., BackWeb Technologies, Inc., Dazel Corp., Netdelivery Corp. and Wayfarer Communications, Inc., it recruited various Internet content providers to broadcast their Web sites to subscribers via channels that are received and read by the push vendor's client software. But now, Intermind and most of these competitors are crafting versions of their products for intranet use.

Intermind is developing Dynamic Publisher, which integrates with corporate databases and can Webcast legacy information. Another version

of Publisher integrates with Lotus Development Corp.'s Domino.

Even PointCast, Inc., the Cupertino, Calif., company that pioneered Webcasting, has released an intranet version of its product, as well as a version that integrates with Domino. PointCast I-Server lets network managers insert corporate channels and block selected commercial Webcasts, and the newer Pro-Server combines local Webcasts and satellite feeds.

Lanacom, Inc. in Toronto entered the push market with Headliner, a free downloadable client that pulls data from any Web site. Headliner Professional, scheduled to ship this spring, is refined for the intranet.

An IT manager can use the Headliner Profiler, which is part of Headliner Professional, to build an agent that will monitor and retrieve specific information from internal or external Web sites, as well as from application files, databases and E-mail, says Randy Busch, Lanacom's vice president of marketing. Users can view the retrieved information in any of several ways, including as a scrolling ticker, as a screen saver or in a mail-like monitoring screen.

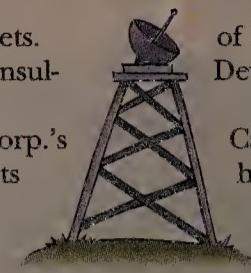
Lanacom is one of a handful of push product vendors pleading neutrality in the Microsoft-Netscape war over Webcast specifications. Headliner Professional's client will accept Webcasts from a variety of channels, including CDF and Netcaster.

So even though Microsoft and Netscape are equipping their respective browsers with receivers that can "tug" technology from Web sites, companies such as DataChannel, Inc., FirstFloor Software, Inc., Lanacom and Wayfarer hope they offer users enough extras — from filters to agnostic support of any Webcast — to get

SELECTED PUSH PRODUCTS

The following is but a sampling of the myriad products using broadcast/subscribe technology.

COMPANY	URL	PRODUCT	PRICING
Autonomy	www.agentware.com	Agentware 1.1	\$49.95
BackWeb	www.backweb.com	BackWeb Proxy Server 2.0	\$10,500 corporate license; free client
Caravelle	www.caravelle.com	Transceive	Not available
DataChannel	www.datachannel.com	ChannelManager	\$7,900 for one server, 100 clients
Dazel	www.dazel.com	MetaWeb	Not available
Diffusion	www.diffusion.com	IntraExpress	\$35,000 for five servers, 100 clients
FirstFloor	www.firstfloor.com	Smart Delivery	\$9,995 per server
Galacticomm	webcast.gcomm.com	WebCast ProServer	\$995; \$49 for personal version
Intermind	www.intermind.com	Communicator 1.5	Starts at \$95
Lanacom	www.lanacom.com	Headliner Professional	\$49.95 (multiuser licenses available)
Microsoft	www.microsoft.com	Internet Explorer 4.0	Free
Netdelivery	www.netdelivery.com	Netdelivery 1.1	Free for clients
Netscape	www.netscape.com	Netcaster (in Communicator)	\$59
PointCast	www.pointcast.com	I-Server	\$995
Verity	www.verity.com	IntelliServ	Not available
Wayfarer	www.wayfarer.com	Incisa	\$5,000 for server, 100 seats



Communications

"Pull" through regular polling works for most clients, unless users need data updates on a just-in-time basis.

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on the desktop as well.

Other newcomers show their intranet orientation by featuring central management tools and extranet functions.

Caravelle, Inc., which markets the WebWatcher site monitoring tool, drew on that technology to build Transceive, a client-based program with an agent the user trains to scan for information and tug it to desktops.

"We can deliver new information — everybody can — but we deliver it in the context of what's changed and provide links to the older information," says Lynda Partner, CEO and president of Caravelle in Ottawa, Ont.

Transceive is much more text-oriented than other push products, Partner says. The agent, which resides in the Transceive Receiver, polls Web sites; the Transmitter hands over only the updated information, not whole Web pages. The Producer converts the information to HTML for display.

Users can specify how they want their deliveries, such as through browser icons, E-mail, a screen interrupt or even by pager.

ChannelManager, scheduled to ship this month from DataChannel in Bellevue, Wash., also gives IT managers push administration tools.

Using the server-based DataChannel, administrators set individual or work-group ChannelBases that give users a selection of both Web sites and non-Web data sources to monitor.

"Microsoft is selling this concept with the Active Desktop, and Netscape has moved in that direction with [Netcaster]. Central management is an issue," says David Pool, DataChannel's CEO. "We're the management system, the back end that creates a desktop for each user and integrates into your infrastructure."

To differentiate itself, Wayfarer promotes the intranet-oriented features of its server-based Incisa. Among those features are the DataBridge function, which retrieves information from databases and legacy sources; group messaging capabilities; and RSA Data Security, Inc. compliance, says Bob Schoettle, vice president of marketing at Wayfarer in Mountain View, Calif.

Wayfarer also offers a "headlinks" feature that will retrieve just a headline of a changed Web site, so the user can choose to click for more material. Webcasts arrive in a client-based Incisa box, not a browser.

Intranets from the get-go

And targeting the intranet from the start, with among the most flexible selections of in-boxes, is Diffusion, Inc., also in Mountain View. IntraExpress works with a variety of other push products; its task is to deliver business documents by whichever channels users want, including Webcasting applications, E-mail, pager and fax.

Browsers aren't the only applications that support Webcasting. Software developer Vantive Corp. is building First-

Floor's push technology into its software automation product line. Vantive Encyclopedia 7.0, a marketing program scheduled to ship in the third quarter, includes FirstFloor's Smart Delivery technology, which broadcasts most document and image formats, not just HTML. Vantive Encyclopedia is the first in a suite of software automation tools that will use this

Webcast technology.

"Smart Delivery is the basis for a very rich set of information delivery tools," says Jamie Schein, director of product marketing at Vantive in Santa Clara. Although FirstFloor's Smart Notification Server uses Java technology, FirstFloor also is a development partner for Microsoft's CDF. Clients must run FirstFloor Smart Subscriber.

"The server-side control agent is important, because our users want to be able to define user groups and publish to specific audiences," Schein says. Vantive customers typically open portions of their intranets to business partners and customers, as does Vantive itself. "We're rolling [Smart Delivery] out to our own sales organization," she adds. ☐

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Circle Reader Service #8

HNS' DirecPC Commercial: Satellite access to your intranet

BY MARK GIBBS



Three months! You're kidding!" This cry is commonly heard in Los Angeles, New York and most other North American metropolitan areas from IT managers trying to get high-speed connections for Internet or intranet access.

A new service from Hughes Network Systems, Inc. (HNS) could considerably shorten that waiting period. The service, called DirecPC Commercial, is handled by satellite-based connections.

DirecPC Commercial builds on the Personal Earth Station (PES) very small aperture terminal system HNS has been offering since 1986 to handle voice, video and LAN traffic. It adds much higher bandwidth IP transport to the HNS satellite service portfolio.

In the U.S., the HNS network consists of three company-owned geosynchronous satellites. HNS has relationships with other satellite operators so it can provide seamless, worldwide coverage.

DirecPC Commercial is the industrial-strength version of DirecPC, a consumer-oriented Internet access product. With DirecPC, requests are sent via a local Internet service

provider and responses are received over the satellite. With the commercial version, data is sent (the uplink) and received (downlink) over the satellite connection.

DirecPC and DirecPC Commercial use IP tunneling technology and spe-

cial software that appears as an IP gateway to the local computer. The software actually creates a data pipe through which all packets to the HNS network are routed.

When accessing a service at an IP address via your local gateway, your request is sent down the IP tunnel to the HNS hub, where a proxy server handles the request and sends it to its destination. The response passes through the proxy server and is returned to you via the satellite link.

Intranets in the sky

With DirecPC Commercial, you can set up permanent virtual circuits (PVC) or switched virtual circuits (SVC) supporting committed information rates allocated in 64K bit/sec portions. Alternatively, you could opt for burst-mode connections that use whatever bandwidth

is available up to a maximum of 24M bit/sec.

Other DirecPC Commercial options are to colocate your intranet servers in the HNS satellite hub or to create a virtual private network (VPN) by connecting directly to the hub via private point-to-point connections. HNS uses a custom routing and firewall system, as well as standard encryption to ensure privacy.

The DirecPC Commercial service is delivered through a PES at each site. The PES consists of

System server and your host name and domain for the DirecPC Commercial interface.

To establish the encryption keys that will be used to secure data transmissions, you connect to the HNS data center by modem. Once you have downloaded your key from HNS and it has registered your card's ID, you have to wait up to 45 minutes for the system to accept data transmissions. Typically, the wait is closer to 20 minutes, and a planned improvement will reduce

PROS AND CONS HNS' DirecPC Commercial

Pros

- It's fast, fast, fast.
- Setup is simple.
- Promises to be cost-effective.

Cons

- Latency is high.
- Will be priced for companies that want to connect at least 100 sites.

SUMMARY: An attractively priced satellite-based solution for your intranet that combines high speed and reliability with simple setup and configuration.

RATING	
Value for money	4
Intranet usefulness	5
Quality	5
Overall	4.7

1 is poor and 5 is excellent.

the wait to about five minutes.

I've been beta-testing DirecPC Commercial for a couple of months and I'm impressed. It's important to note, however, that the minimum latencies from your computer to the HNS hub and to Internet sites are around 400 msec and 900 msec, respectively. That's a bit different than the typical Internet access latencies — between 200 msec and 300 msec — experienced while using dial-up services.

With interactive services such as Web browsers and File Transfer Protocol sessions, the satellite-induced latency produces a short but noticeable pause. The delay while using character-oriented services such as telnet is positively uncomfortable. However, once you have access, the data transfer speed is so fast that when, for example, a Web page does appear, it typically pops up all at once.

Services and pricing

When used for wide-area intranet connections, DirecPC Commercial has some interesting attributes in addition to raw speed. Other services supported are a package delivery service, MPEG1 and MPEG2 video distribution and multicast services for datastreams such as stock ticker services. The package delivery service, which allows for a collection of files to be examined and retrieved individually on demand, is useful for routine bulk data retrieval or library functions.

At press time, HNS was still building its price list for DirecPC Commercial, but the cost promises to be affordable.

Latency aside, the performance is terrific and the service is reliable. ☐

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Mutual fund giant Fidelity Investments is building an intranet-centric information architecture anchored by a huge data warehouse.

No one can accuse Fidelity Investments of thinking small when it comes to intranets. The mutual fund powerhouse expects its 20,000 employees to be using

Web browsers to access the bulk of its information resources within three years.

While this will vastly simplify the task of managing desktops in this worldwide corporation, even more important is a complementary effort to pull the firm's mammoth data warehouse into the intranet fold.

Together, the efforts represent nothing short of a fundamental transformation of the way in which Fidelity distributes and uses mission-critical information, says Timothy Davis, director and principal technologist of the company's Administrative Information Management Systems' Data Warehouse Group.

Timothy Davis (third from left) and his team are pushing Fidelity's massive data warehouse onto the company intranet. From left to right: programmer Brian Jones and systems analysts Kathy Locke and Suzanne Bixby.

BY JOHN DIX

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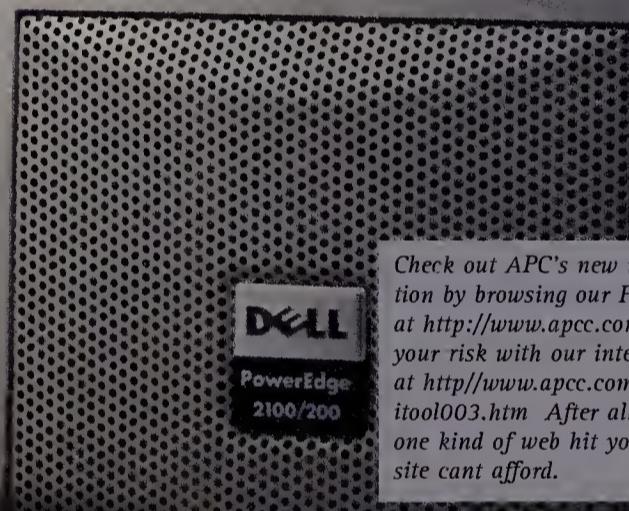
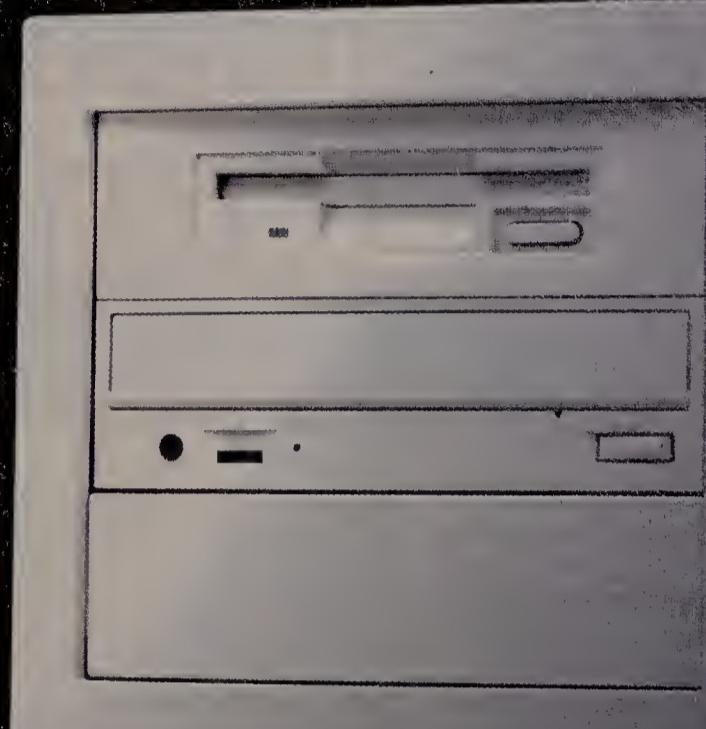
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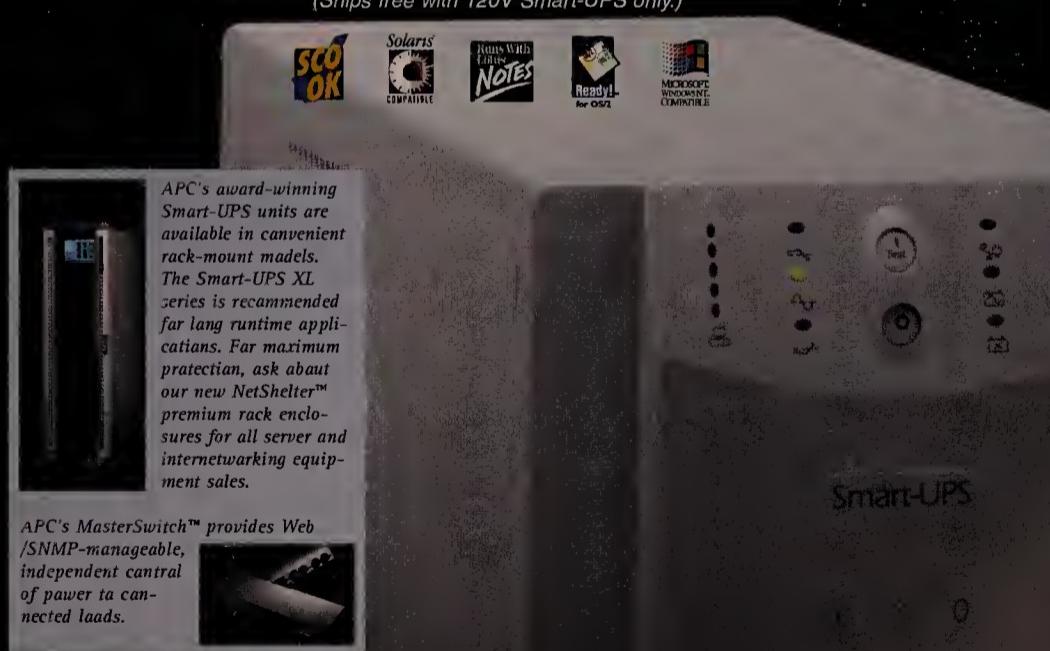


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So much for posting dental forms. Actually, Fidelity already uses its intranet to support these more mundane functions. But the larger goal is to influence the very way the company conducts business.

Data delivery

In terms of data distribution, Davis says desktop complexity is driving the need to adopt Web browsers as universal clients.

"The cost per desktop of the old paradigm, a Windows PC with lots of applications, has become quite significant," he says. "And even more significant is the maintenance of the desktop. Anyone can download software so every desktop is unique. We get into a lot of conflicting applications and a lot of desktop configuration issues. So we're heading toward more of an Internet delivery mechanism with thin clients."

The typical Fidelity desktop today is a Windows 95 or Windows NT machine outfitted with Microsoft Corp.'s Office, a Netscape Communications Corp. browser and a host of other applications specific to the user's needs.

"Most of the problems are with stability. We have conflicting software, conflicting drivers and even problems with database connectivity," Davis says. People pull their hair out around here because of these things. Moving to an

Internet desktop would solve that because your connectivity is now on the back end as opposed to the front end."

Davis says the Internet desktop vision has browsers serving as universal front ends to all other applications, even Windows applications. Applications become modular and network-based. Users access only those application functions they need, cobbling together custom programs on the fly. "I may end up with an application that's 10% Word, 2% Lotus Notes, 5% this, 5% that," Davis says.

The world of component software won't arrive overnight. "It's probably two to three years out," Davis says. "Java is still developing, the whole language base is still in flux, and we have a lot of users tied to Windows. So it is going to be a progression. But as the functionality and capability of the browser improves and more importantly, the network bandwidth issues start to go away, this will become a much more effective delivery vehicle."

Asked whether the current industry focus on cost-of-ownership issues is driving the company down this path, Davis says it is more a matter of survival: "We have a certain head count and a certain set of resources to deliver the information we need to deliver. If we don't become more efficient at what we do, we aren't going to meet our milestones."

SHOULD MICROSOFT BE AFRAID?

In Fidelity's vision of the future, employees will use Web browsers to access most information resources. Does Microsoft Corp. stand to lose control with megaplayers like Fidelity making such shifts?

"I don't think Microsoft should be afraid," says Timothy Davis, director and principal technologist of Fidelity's data warehouse group. "They have the potential of remaining centric to the desktop because everyone still needs Microsoft Office."

But the battle won't be for the desktop if Fidelity has its way. The company is building toward a future where application logic sits out in the network and users build custom programs by picking and choosing functions from multiple application sources.

Seamless integration with browser environments will be key for Microsoft, and indeed the company is already headed in that direction.

Data stockpile

Complementing this push is the data warehouse initiative, which is designed to improve the quality of information available to Fidelity's browsing users.

The principal challenge is providing a uniform view into Fidelity's varied systems, which include multiple trading systems, accounting systems, custody systems and pricing systems, many of which are scattered around the world.

"It's been very difficult to get a clear, consistent view of worldwide information, worldwide trading, worldwide holdings, and most important, worldwide exposures," Davis says.

Fidelity is pursuing a solution based on a data warehouse from Red Brick Systems, Inc. and a host of decision-support tools. The latter make it possible to pluck information from the warehouse and other resources and deliver it to different types of clients, be they Web browsers, Windows-based machines or pagers.

The decision-support tools are the glue in the middle, a middleware layer that couples the warehouse to the desktop, resulting in a three-tier architecture.

The top layer is the Fund Intellect data warehouse, an SQL system that contains data gleaned from Sybase, Inc. and Oracle Corp. databases, as well as other data sources. This warehouse was originally developed to give trade controllers a view into trading activity — total trade volumes, where trades stand in the settlement process, what the life cycle of a trade looks like and historical information going back seven years.

"A trade goes through many steps in a process," Davis explains. "Once it's executed, it can go through a cancel process, a rebook process or even fail outright, which represents an exposure for the company. So it's very important for us to track and understand which brokers are giving us good executions and which markets we are going into."

But SQL constrains how the warehouse can be used. "From a business standpoint, SQL is a very limited language," Davis says. "Typically, you want to ask questions like, 'Show me this month vs. last month,' but there is no

structure within SQL to do that. So you build temporary tables or do multiple passes and try to pull all the data back to your desktop. But if you have a 200G-byte warehouse like we do, it becomes prohibitive to do that. The whole reporting system just breaks down."

Enter Fidelity's decision-support system, which it calls Trade View. Trade View is actually a collection of information tools Fidelity uses to help make sense of the reams of data the company collects and generates. The idea is to run these tools on a Unix server dedicated to the task of querying the warehouse, building intermediate data sets, and then converting the results into reports that can be viewed in various ways.

Together, the tools represent "an active middleware that basically moves the processing from the fat client desktop out onto a server," Davis says. "The desktop simply becomes a dumb device, and all the processing occurs out on the network."

The various decision-support tools all fit into a framework provided by Information Advantage, Inc.'s DecisionSuite product. DecisionSuite lets users build queries using business terms as well as look at things dimensionally, and it supports both browser and Windows clients, all of which are important criteria for Davis.

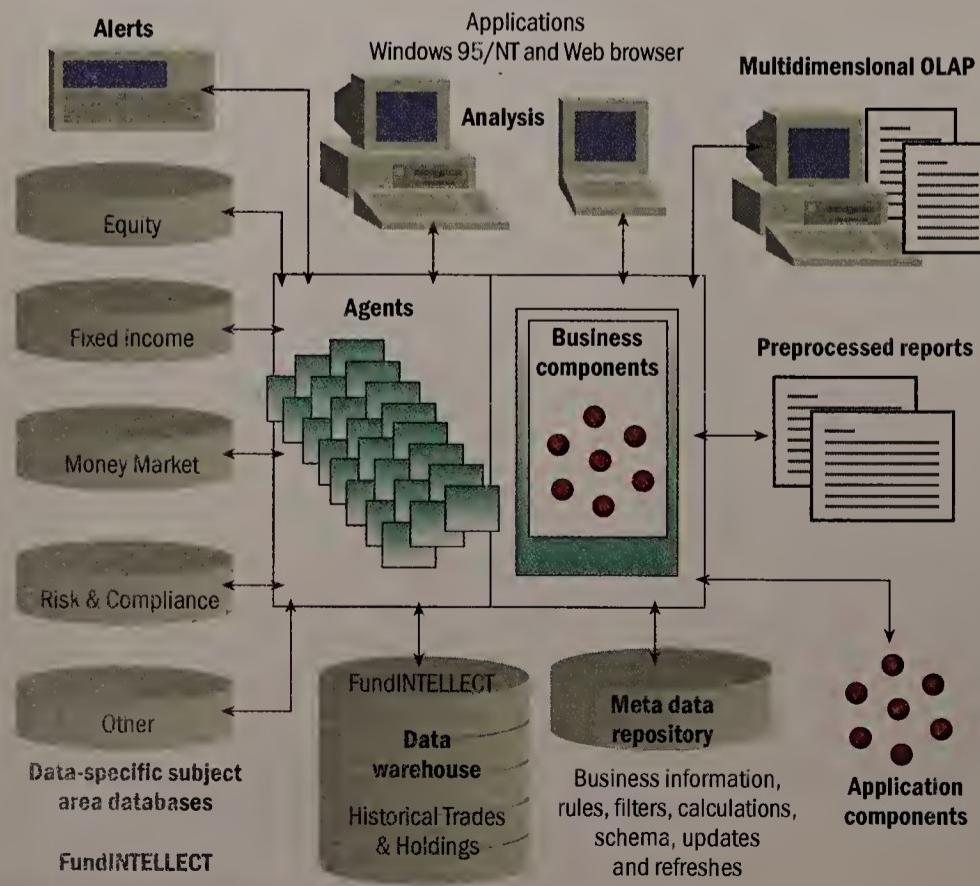
DecisionSuite also has two other advantages: a meta data focus, meta data being information about the data in the system; and support for proactivity, meaning it can alert users when certain conditions arise.

"Meta data is really the connection piece with the users," Davis says. "It lets them access structured and unstructured data and find information about things like, 'When was this last refreshed,' and 'How often does this show up?'"

Users can build reports by simply dragging and dropping elements. Users could, for example, include a time period, a trade and a portfolio, and specify a trading desk, a currency, country, market exchange and so on. "So they're working in an environment

DECISION-SUPPORT MODEL

Fidelity Investments' plan is to pull its massive data warehouse onto the corporate intranet and couple it with many decision-support tools that make it possible to query the warehouse using business terminology. The combination will also make it possible for employees to generate reports that would otherwise be hard to accomplish using the SQL-based warehouse and deliver the results to both Windows 95/NT clients and Web browser users. The decision-support framework is called Trade View and is based on DecisionSuite from Information Advantage. Timothy Davis, director and principal technologist of Fidelity's Administrative Information Management Systems' Data Warehouse Group, says Trade View can be thought of as a layer of "active middleware that basically moves processing from the fat-client desktop out onto the server."



Enterprise Network Management

Understanding SNMP, SNMPv2 and RMON

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. Today's enterprise network management systems need to manage thousands of elements — from the hardware devices all the way to the applications and processes running on these networks.

SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With those enhancements, however, come additional challenges for the network manager.

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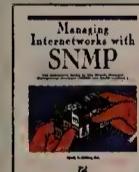
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5. Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP
6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements: SNMPv2u and SNMPv2*
8. Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats
9. Understand the key differences between the RMON and RMON2 standards for remote management of the enterprise
10. Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems

with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDS and ATM.

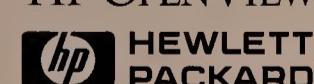
You will also be introduced to the next generation of network management: Web-based tools that integrate SNMP and browser technology. This new technology consists of three components: network management software which runs on a Web server, proxy agents which operate on the managed devices, providing updates to the Web server, and a browser-equipped workstation that can access those management details from any location within the enterprise.

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Marc Andreessen
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that's familiar to them," Davis says. "And, through the meta data, the Information Advantage product then translates that into queries. It may have to do a couple of hundred queries to actually build this one report."

The resultant report can be sliced and diced into more granular reports, all with different criteria. Fidelity some-

times calls these reports "data cubes" because they enable users to look at information in lots of different ways.

DecisionSuite also allows security to be brought into play, so the fixed income trading desk only sees fixed income trades and doesn't see equity trades, and vice versa, while trade controllers can see all trades. "This is very

important because it provides a common security base across the Windows desktops and the browsers," Davis says.

Proactivity is provided through DecisionSuite intelligent agents, which Davis describes as human surrogates. "A user may have several hundred agents looking for different things, and when one of them finds something, it

sends out a notification. That's important because few people have three or four hours to spend querying their way through the data warehouse. We have to build these systems so they are proactive, so they're alerting people."

In practice, this will enable risk managers, for example, to use agents to look for exposures, such as limits being exceeded, or trade controllers to identify unusually large trades. And DecisionSuite can deliver the alerts to Windows desktops, Web browsers, pagers or even mail systems. This specifically addresses Davis' goal of increasing efficiency.

Global perspective

Extending all this rich functionality to Fidelity offices around the globe is no small problem. The data warehouse is up and running, but the Information Advantage products are only being used by 20 people in Boston and another five or six in Texas. The plan is to roll out the products to 100 people representing a variety of Fidelity disciplines.

But that raises the issue of whether to keep the warehouse and decision-support tools central or distribute them around the world. "We're making a stab at keeping it central, having people in foreign lands directly access the warehouse over the company intranet," Davis says.

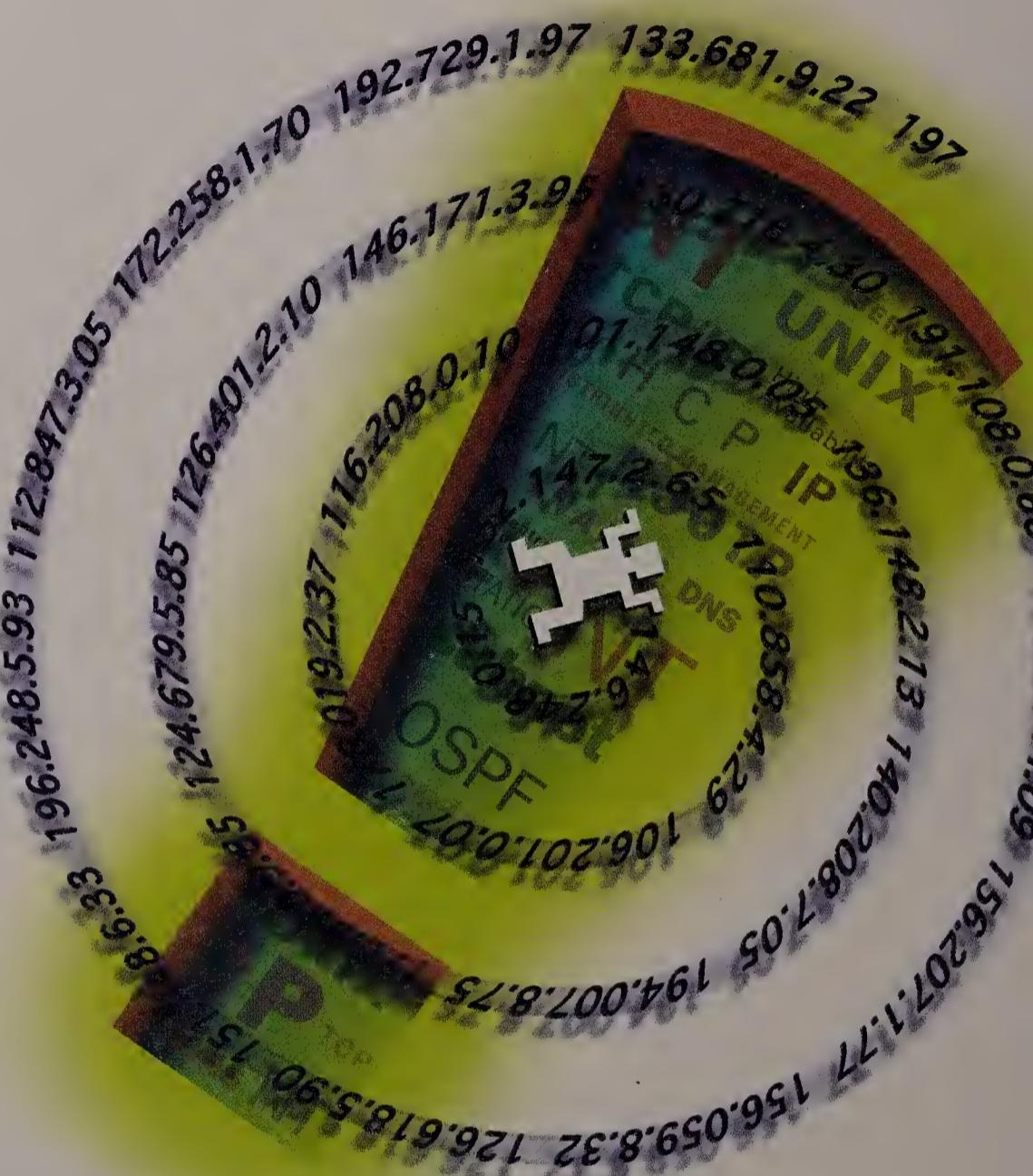
While there is some question whether network delays to places such as London and Tokyo will be a problem long term, the impetus to keep it centralized is huge. The company does trading worldwide, so there really isn't an end of day. The warehouse is almost always humming.

"When a trade comes in, we do load, index and referential integrity checking, and try to maintain aggregation levels across the system in a continuously flowing process," Davis says. "These are not trivial tasks, and you have to have it very well synchronized for it to run effectively."

Further driving the desire to keep it central is the company's move to trickle feeding the warehouse. While many companies update their warehouses once a month or once a week, Fidelity wants to update its warehouse every 15 minutes. "That will enable us to do intra-day decision making," Davis says.

Sound ambitious? Everything related to Fidelity's intranet-centric vision of computing is ambitious. But the highly competitive world of mutual funds demands nothing short of full throttle. After all, when information is the lifeblood of the industry you compete in, you can't afford to be left behind.

"The intranet is going to make delivery of data very easy, but it doesn't solve your data quality problem," Davis says. "You have to put your data warehouse on the intranet and set up the infrastructure so you can integrate your structured and unstructured data." ☐



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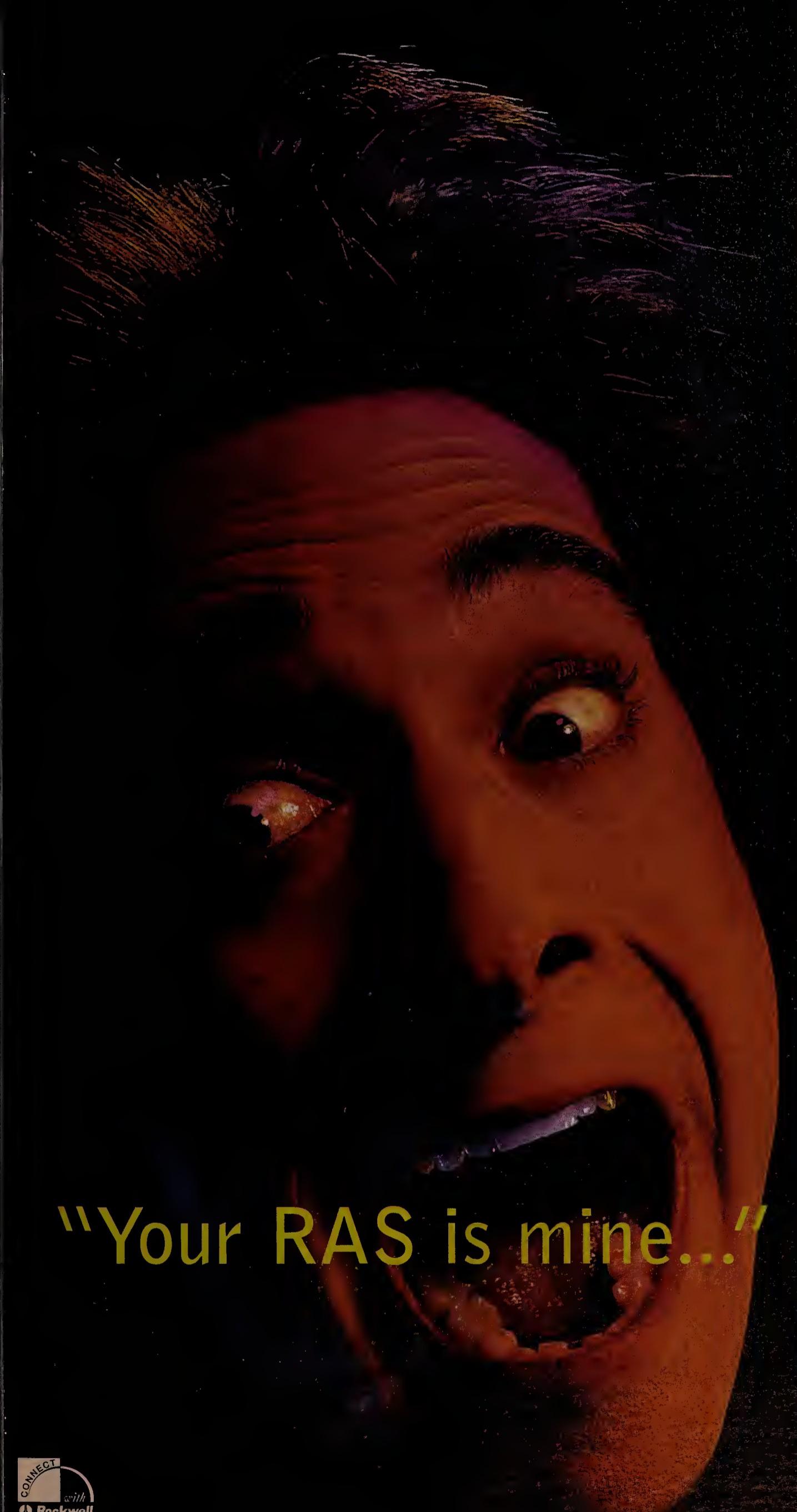
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LEGAL LIMBO

The law on electronic links and digital ink is rather nebulous, especially when it comes to the intranet, but legal eagles have their tips on how to avoid being part of the court action.

BY PEGGY WATT

The depiction of Dilbert, patron saint of engineers, is a clever and welcome addition to the IT departmental home page, right? It's just like tearing it out of the newspaper and tacking it to a bulletin board, isn't it?

Well, maybe. Ask two lawyers and get three answers.

The truth is, no one's sure how all the laws and policies that apply to paper stand up against electronic links and digital ink, especially on an intranet with its theoretically limited exposure.

But certainly, check with your corporate attorneys. After all, they're on the payroll to advise and, if necessary, defend you.

"I don't believe there are many hard and fast rules, but there are definitely tips and techniques for how to avoid a lawsuit," says Elaine Martel, corporate counsel for Shiva Corp. in Bedford, Mass. Essentially, she advises erring on the side of caution.

On a short leash

Under Martel's direction, Shiva treats intranet documents with the same care as Internet documents, which usually undergo legal review before posting. Shiva's own products are protected by copyright and patent law, so the company should be conscientious about proper use of copyrighted materials, Martel points out.

Shiva's policy on posting electronic clippings

from magazines and newspapers is "don't." Copyright laws preclude making photocopies of a magazine article and passing them around; at least online, a manager can send E-mail containing a URL and let readers browse for themselves. Even better, companies can obtain electronic subscriptions to journals and professional publications, so these companies have appropriate multiuser licenses for online access to materials.

Martel says Shiva's policies are strict because it extends intranet access to some customers and business partners. If outsiders come in, postings should be a little more formal because the intranet isn't all in the family anymore, she says. Martel even discourages intranet links to external Web sites because of potential confusion about where Shiva's property ends and someone else's begins.

"A good rule of thumb is to keep confidential information off the network," Martel says. Some peeks inside could be embarrassing, while others could be downright dangerous.

For example, investors who have extranet access should not see marketing promotion drafts or financial information that are works in progress. Marketing claims that are too proud or exaggerated, or projections so optimistic as to be unreasonably misleading, can lead to liability if an investor takes action based on that information.

Business first, and always

Shiva also discourages its employees from having personal home pages on the intranet. Employees might cross into legal limbo when posting their favorite poems or embedding an audio clip of a song, for instance.

At Baltimore-based GE Information Systems, the legal department wrote an acceptable use policy (AUP) that prohibits personal home

"You end up not being able to do anything if you're too strict. That's not what the law was intended to do. Don't get too uptight."

Howard Anawalt,
law professor,
Santa Clara University

CINDY CHARLES





pages, says Raj Rawal, chief information officer. "Allowing personal home pages would mean we would have a lot of policing to do."

Still, the Webmaster spot-checks the intranet's content for inappropriate topics. "We haven't had any problems," Rawal says.

Digital Equipment Corp. also prohibits personal Web pages, and every departmental page is approved by a content task force, says Kathleen Warner, Digital's director of Internet and intranet deployment.

"A legal task force defines the wording required on every internal and external page," Warner says. A brand task force reviews every published page for compliance with design specifications and treatment of Digital's trademarks.

Many firms say they pay particular attention to corporate trademarks, inside and out, in electronic form or on paper. Sharyn Fitzpatrick, senior director of marketing communications at Knight Ridder Information, Inc. in Mountain View, Calif., checks intranet pages for proper placement, color and use of the KRI logo. Again, the impetus is likely intranet access by customers and business partners.

Companies should take care not to misuse another firm's trademark, says Howard Anawalt, law professor at Santa Clara University in California.

"You might [jokingly] refer to your competitor's trademark in an internal discussion, but you need to avoid using the term outside with respect to sales of your goods," says Anawalt, adding that outside exposure could leave a corporation liable.

Virtual handcuffs

The good news is violators are not likely to end up in jail; but carelessness could be an expensive lesson. Copyright infringement and trademark misuse usually bring fines, which can be hefty. And, of course, there are always the legal fees.

The smart corporation puts an AUP and content guidelines in place before anyone goes online, says Michael Rustad, director of the High Technology Law Program at Suffolk University in Boston. Corporations want to encourage new enterprises. But precedent holds the companies liable for what employees do with corporate equipment, so caution is advisable.

"Post disclaimers that you, the employer, aren't responsible for content unless you're going to monitor it and censor it," Rustad suggests. "But a company can be found liable even with disclaimers, so educate your people."

Don't assume existing business practices cover online activities, Rustad adds. Just as users are urged to observe netiquette on the Internet, corporate users may have to learn a variation — say, intranetiquette — on the internal Web, he says.

But copyright laws allow some latitude, Anawalt says. "There are some very powerful legal concepts of fair use," he says. For example, "to hyperlink in itself is not making a copy, but it facilitates copying easily, so it raises the question," Anawalt says. "I think considering the link itself a copy is stretching it too much."

Even the intranet that starts out loose like the Wild West can become lawful.

"If you hold the intranet too closely, too tightly, you will smother it like a child that you never allowed to leave home," says Jim Griffin, vice president and technology director at Geffen Records, Inc. in Beverly Hills, Calif. He

encouraged users to help craft the company intranet.

"At first, everything they did was either copyright infringement or theft of some kind," Griffin says ruefully. "But they learned."

And as for Dilbert — keep him in hard copy on the wall, the experts advise. ☺

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Circle Reader Service #5

NO quick fix

BY ELISABETH HORWITT

It's an all-too-familiar headache for client/server system managers: How to administer user accounts across a rapidly expanding body of messaging, database, file-sharing and groupware services, each with its own directory, user names and security routines.

Now that headache takes on migraine proportions with the intranet.

Just ask Alameda News Group — it's been hammered by directory pains associated with a growing intranet, says Kevin Hamilton, online network administrator for the California news chain.

Each of the company's six newspaper divisions has internal Web servers that support back-end services such as database querying, file sharing, messaging and HTML publishing, Hamilton says. Many services have their own directories — a total

**If only getting rid
of the pounding
headache brought
on by the exploding
intranet and the
need to integrate
directories were as
easy as popping a
couple of Tylenols.**

of 15 at last count — that IT has to administer, he adds.

To further complicate matters, each news division maintains its own "shares," sets of HTML files users can access from different Web servers. "We have 13 NT servers, each with two or three different shares," Hamilton says.

It's an administrative nightmare, he says. For example, users must allocate a virtual drive letter on their Windows 95 or DOS workstations for each share they need to access. Accessing 15 shares means keeping track of 15 virtual drive letters.

Primarily a Microsoft Corp. shop, Alameda News Group hopes to solve the problem with Microsoft's upcoming NT 5.0 Active Directory, previously called Cairo. With Active Directory, IT would be able to implement a global directory infrastructure and centrally administer a single set of user logons and security mechanisms across NT-based

intranet servers and applications, Hamilton says.

An Active Directory environment means a simpler life for users, too; with it, users could access different servers with the same logon and security routine, Hamilton says.

The object of IT's desire

The need to manage user access and security across an exploding intranet gives IT managers the impetus for integrating disparate directories, says Bill Mellicker, a manager in Andersen Consulting's Network Solutions group in Chicago. The motivation gets even stronger when they get serious about intranet-based application development using object-oriented tools such as SunSoft, Inc.'s Java, he adds.

"Directories become the way [for application objects] to find other objects," Mellicker notes.

America Re-Insurance Co., for example, is building an enterprise object model describing workflows as the foundation for business-critical, object-oriented applications. The multitier model will comprise client applications built in Java and Microsoft's ActiveX that make queries through the Object Management Group's Common Object Request Broker Architecture to back-end functions and services, says Alan Nugent, chief information officer at the Princeton, N.J., company.

"You can't just have a library of objects," Nugent says. "You need a framework to describe how the pieces plug in [and communicate]."

Part of that framework will be an enterprise-wide directory of objects and their attributes. The directory will enable application and service components to communicate with one another across the enterprise, Nugent says.

Many IT departments share that vision. The challenge is trying to make it reality not just across the intranet, but across all corporate network servers and applications.

Companies that will find it easiest to integrate directories are those that are standardized on a single major platform vendor for network service needs.

That is the case with the city of Tucson, Ariz., a NetWare 4.1 shop that recently adopted Novell, Inc.'s

IntranetWare as its intranet server platform. Within the next six months, the city expects to implement Novell Directory Services (NDS) as the single global directory across all its network services, including the intranet, says Mike Hicks, a network engineer for Tucson's transportation department.

"NDS will give us a central point from which to look at and administer the entire Web across multiple departments, in terms of what users can access," Hicks says.

The trouble is few major corporations have the luxury of buying their network operating system (NOS), application and intranet servers from one vendor. More typical is the company that has NetWare file and print servers, NT application servers and Netscape Communications Corp.'s Enterprise Server for the intranet.

And even if a corporation manages to stick with NT and Active Directory or NetWare and NDS, for example, it still has to integrate the directories of various proprietary network applications.

With NT servers, Microsoft applications on the desktop as well as some Novell, it is very complex to create a single directory infrastructure, says Neil Pitts, manager of strategic infrastructure programs at Eastman Kodak Co. in Rochester, N.Y. Kodak has to integrate the security mechanisms embedded in individual applications — some commercial and some created by a department to fit its own needs, he adds.

"We want a product that places standards across all things — like the E-mail directory and the authentication onto the [intranet] server, so you don't have a hundred different IDs and passwords," Pitts says.

Enter directory standards

Kodak is one of many companies hoping the emerging Lightweight Directory Access Protocol (LDAP) and X.500 standards will help solve multidirectory integration problems — at least in the long run. For now, neither standard is fit to integrate the disparate environments of NOS, messaging and intranet, experts agree.

But LDAP, developed by the University of Michigan as a simple, easily implemented client access protocol for X.500 directories, provides a lot of promise as an industrywide directory standard. The Internet Engineering Task Force (IETF) is responsible for further developing LDAP, and vendors such as Banyan Systems, Inc., Microsoft, Novell, Oracle Corp. and WorldTalk Corp., already have pledged their directories will support LDAP-based access.

This paves the way for IT to manage multivendor directory installations via a single LDAP-compatible client. But it does not let IT set up a

single umbrella directory structure that defines user access and security mechanisms across disparate network services. "LDAP is a Band-Aid," says David Passmore, president of Decisys, Inc., a network consulting firm in Herndon, Va.

LDAP lacks directory-to-directory replication, a key global directory infrastructure feature of X.500 and leading proprietary global directories such as NDS, Passmore notes. Replication enables directory updates, such as a change in user logon or

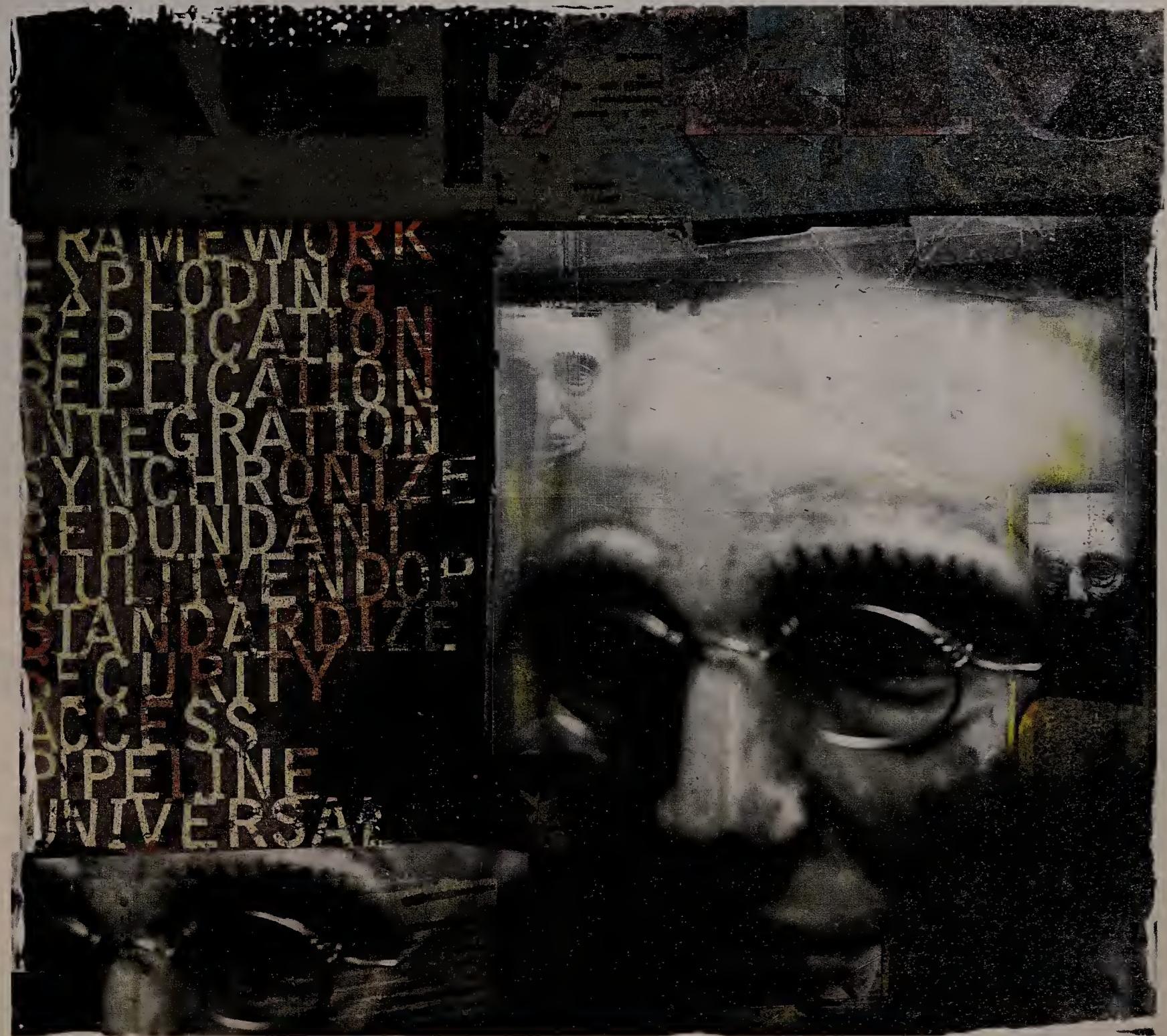
LDAP Version 3, due by year-end, will support Secure Sockets Layer security. The ability to control access to different directory parts is essential so, for example, only administrators have the ability to change directory entries or access sensitive records.

Netscape has adopted LDAP as the basis for its Directory Server, used within its Enterprise Server and SuiteSpot application suite. However, Netscape is relying on its own enhancements to address some of LDAP's functional gaps, says Frank

opment] platform and directory service are tightly integrated with messaging and discussion groups. You can build [object-oriented applications] that exploit directory capabilities in a single framework."

Of course, that's for users willing to standardize on Netscape platforms plus Java.

Other leading vendors also are adding "value-added" extensions to LDAP, making it likely that the universal client access and multivendor directory interoperability provided by



address, to be propagated across different directory structures, overlapping portions of one directory or copies of the same directory on different servers.

Replication allows a company to synchronize a directory that may be distributed to different branches around the world. It also sets the groundwork for managing multivendor directories as a single entity with a common set of user objects.

Replication features are expected in LDAP in the next year or two.

Chen, senior product manager for Directory Server.

For example, Chen says, Netscape Communicator allows the LDAP directory embedded in SuiteSpot to query other LDAP-compliant directories, as well as X.500 directories, for user information.

"Netscape's integration of LDAP into its platform is a really important step, as far as enabling object-oriented distributed applications [on the intranet]," says Andersen's Mellicker. "Netscape's ONE [application devel-

the standard will be diluted to a lowest common denominator.

Further complicating matters is the recent appearance of other client-to-directory APIs, which are ways to complement, but in some sense compete with, LDAP. One is Sun's Java Naming and Directory Interface (JNDI), for which Novell recently announced support. This interface will enable programmers to write Java-based applications that perform management functions across any vendor global directory supporting

P. 31

There is also Lightweight Internet Person Schema (LIPS), a specification proposed as an IETF standard by the Network Applications Consortium. LIPS defines a common set of directory attributes, such as E-mail address, last name, URL and digital certificate.

The idea is to present key directory information in a standard format independent of the vendor directory accessed by an LDAP client. Banyan, IBM, Lotus Development Corp., Microsoft, Netscape, Novell, WorldTalk and Zoomit Corp. have all promised LIPS support.

The X factor

Not all vendors or users are abandoning X.500 for LDAP — at least, not entirely.

Kodak, for instance, is considering LDAP as a pipeline between an overall X.500-based global directory and the proprietary directories of major intranet applications such as Lotus' Domino, says Kodak's Pitts. Domino would use LDAP to search against the X.500 directory to find an address that is not listed in Domino's name and address book, he says.

Given LDAP's current functional gaps, some industry analysts and users see X.500 as the only viable de facto global directory standard right now.

"It's a real headache to propagate and synchronize redundant versions of directory entries," says David Ferris, president of Ferris Research in San Francisco. "Companies have to migrate to a single, logical directory, which means a distributed directory whose components talk intelligently to each other. And X.500 is the only possible standard for distributed directories."

While X.500 products are focused primarily on the messaging world, much more can be stored in an X.500 directory structure, Ferris says. Network administrators could, for instance, keep public keys for secure access to applications in an X.500 directory.

But there's a problem. While the

messaging world has coalesced around X.500, the NOS vendors have limited themselves to X.500-like directories that don't interoperate.

LDAP, in contrast, has won support from NOS and application server vendors that play in the intranet world, and that support may broaden. Novell, for example, is eager to support an LDAP-based replication standard if it provides functionality comparable to NDS, says Michael Simpson, NDS marketing manager at Novell.

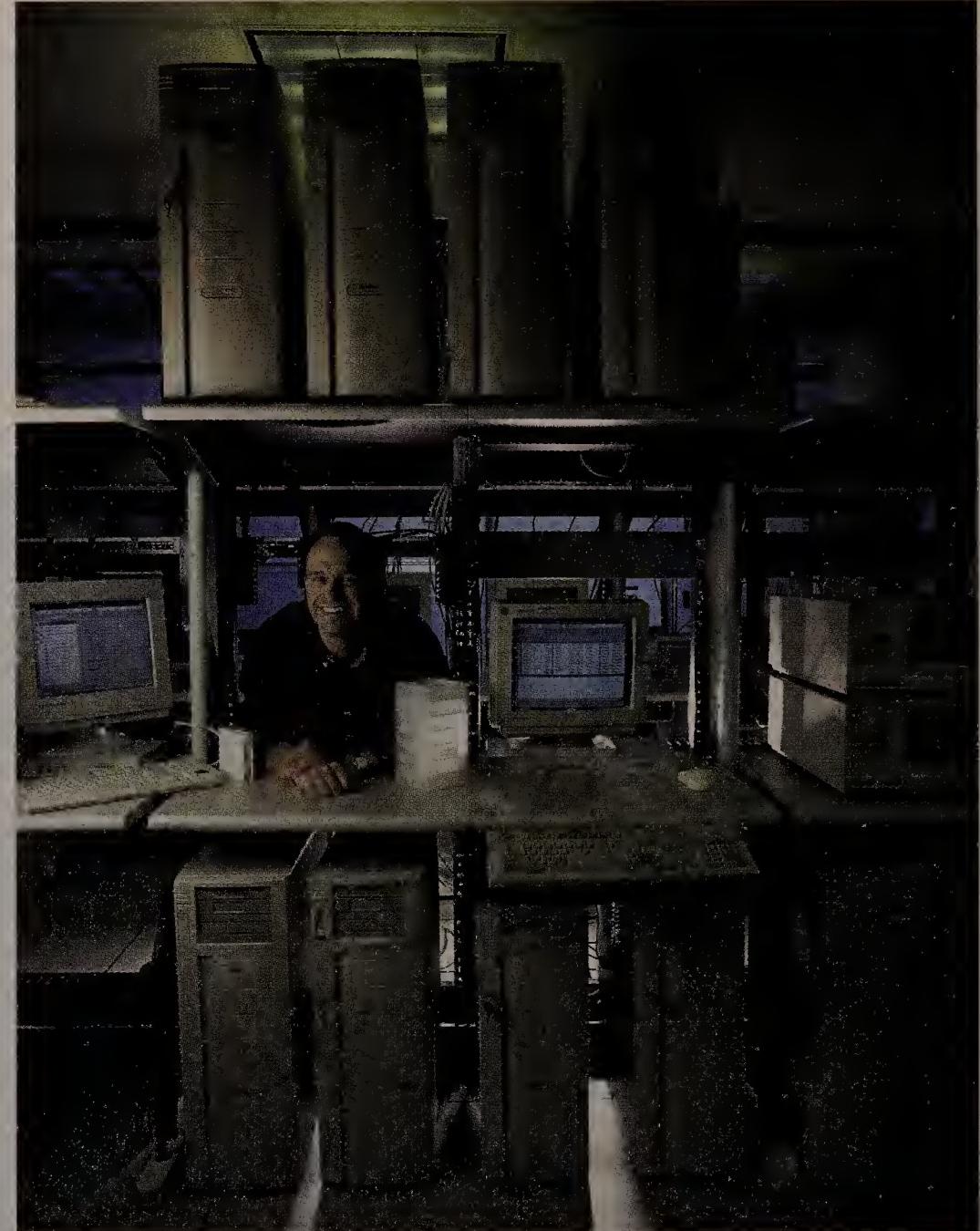
With LDAP being "aggressively enhanced, it may well come to replace most of the actual X.500 protocol," Ferris says.

In the meantime, many companies are evaluating the kind of integration role LDAP can play in concert with a more or less proprietary directory. America Re-Insurance, for example, is looking at LDAP, Microsoft's Active Directory, Netscape's Enterprise Server and Novell's NDS, Nugent says. Given that the company is still in the early phases of its application architecture, "We can afford to wait," he adds.

For a giant corporation such as America Re-Insurance, the choice of a global directory will depend not only on features such as scalability, ease of implementation and administration, but also — and perhaps most importantly — on the directory's ability to extend across a company's unique legacy of network services and applications. LDAP-based client access of multiple directories is fine, but what IT managers really want is a single, corporate-wide directory infrastructure for their messaging, groupware, intranet and database back ends.

At the back end

Microsoft, Netscape and Novell are moving aggressively to fill this need by integrating their respective global directories with their own and third-party back-end services, intranet and otherwise. The three companies are taking the "open" road by supporting the LDAP client interface and providing



For companies serious about object-oriented application development on the intranet, a global directory is a must-have, says Bill Mellicker, a manager at Andersen Consulting.

open, complementary directory APIs.

Microsoft recently introduced Active Directory Service Interface, a set of high-level Visual Basic APIs that facilitate the integration of applications with Active Directory, LDAP, Netscape's Directory Server and NDS.

Meanwhile, Novell has made NDS source code available free to database, E-mail and groupware vendors. Oracle has endorsed NDS as the directory service that will support communications among object-based application components within its Network Computing Architecture.

Novell also is moving aggressively to make the NDS operating system independent. The service now runs on Unix versions from Hewlett-Packard Co. and The Santa Cruz Operation, Inc. (SCO), and will soon work on NT.

HP, Novell and SCO are close to releasing Scale Pack, a utility for providing directory and file replication, synchronization and distributed management across NDS on IntranetWare, HP-UX, SCO Unix and Windows NT servers.

Through NDS, users will be able to administer a single user account for an intranet service, an Oracle database, NetWare, NT operating systems and modem bank dial-in, Simpson says.

On the intranet front, Novell is working with Sun on NDS-enabling Java class libraries.

So what is a corporate intranet architect to do?

One possibility is to wait, like America Re-Insurance, for key products and standards to mature and gain broader third-party support. Another is to follow Kodak's example and devise a short- and a long-term directory strategy.

"We are in the testing phase now for a global directory based on WorldTalk's NetJunction to provide primary mail addresses and objects, such as public key certificates that authenticate individuals [for access to services across the intranet]," Pitts says. The directory also would be the place where servers and clients would go to find intranet news and information, such as user addresses and new services, he adds.

And LDAP would hopefully provide the means for departmental or organizational security mechanisms to interact with the overall directory.

Kodak's long-term goal, however, is a single directory structure, perhaps based on X.500, that all applications would access directly, eliminating the middle tier of multiple proprietary directories, Pitts says. "But, I don't know when we'll get there" ☐

TAKE TWO ASPIRIN AND . . .

You may be able to relieve the pressure a bit, but implementing a global directory service for your intranet remains painful. Here are some technologies to watch:

X.500: The messaging world has coalesced around X.500, but the NOS vendors have limited themselves to X.500-like directories that don't interoperate.

LDAP: This client access protocol for X.500 directories provides promise, but some major functional gaps need filling.

Proprietary LDAP extensions: These are great if you're willing to standardize on a single vendor, but they could result in diluting interoperability to a lowest common denominator.

Client-to-directory APIs: These are meant to complement, but in some ways compete with, LDAP. Sun's JNDI is one example.

LIPS: This IETF initiative defines a common set of directory attributes, such as E-mail address and last name.

Directory APIs: These interfaces — Microsoft's ADSI being one example — provide a way to integrate a vendor's global directory with its own and third-party back-end services.

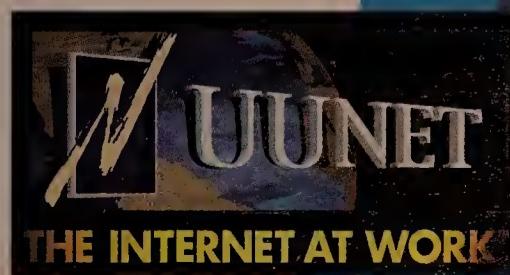




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SEEING INTO THE FUTURE:

*Is this technology
destined for your
company intranet?*

BY MARK GIBBS

Welcome. The swami is here to divine your future, and I see a technology coming to your intranet that will eat up bandwidth, cause network congestion and force you to upgrade your network infrastructure far faster than you plan.

The technology is desktop videoconferencing, and it may well surpass the telephone's popularity for internal communications. This is because, by putting people face to face, desktop videoconferencing allows for more satisfactory exchanges than the telephone.

What's more, desktop videoconferencing can be extended to support additional media and used for application sharing. And the technology is fairly easy and inexpensive to implement.

Today, the entry point for low-end desktop videoconferencing is a 28.2K bit/sec dial-up line, a video camera that costs as little as \$100 and conferencing software that ranges in price from free to a few hundred dollars per seat. This differs significantly from traditional videoconferencing, which typically requires at least a dedicated ISDN line and hardware and software totaling thousands of dollars.

For your intranet, you'll need a product that runs directly over LAN or TCP/IP connections. This includes products such as Connectix Corp.'s VideoPhone, Microsoft Corp.'s NetMeeting and White Pine Software, Inc.'s Enhanced CU-SeeMe.



VIDEOCONFERENCING ON INTRANETS

NOTABLE DESKTOP VIDEOCONFERENCING VENDORS

Vendor	Product	Platforms	H.32X	Standards supported	URL
Apple	QuickTime Conferencing	Macintosh	H.320	Whiteboarding, multipoint conferencing	qtc.quicktime.apple.com
Connectix	VideoPhone	Macintosh, PC	H.324	Whiteboarding, multipoint conferencing	www.connectix.com
InSoft	Communique	PC, Unix	H.320	Whiteboarding, multipoint conferencing	www.insoft.com
Intel	Internet Video Phone	PC	H.323	Not applicable	www.intel.com
Microsoft	NetMeeting	Macintosh, PC	H.323	Application sharing, whiteboarding	www.microsoft.com
White Pine	Enhanced CU-SeeMe	Macintosh, PC	None	Whiteboarding, multipoint conferencing	www.cu-seeeme.com

EDS Corp. is using CU-SeeMe to add a videoconferencing system to the Department of Defense's intranet. The company is employing a custom Java applet to drive the ActiveX version of CU-SeeMe and Winnov L.P.'s Videum video camera and video/audio cards, says Brett Glass, EDS systems engineer.

The Defense Department will use the system for collaborative telemedicine among Veterans Affairs hospitals. For a small cost, any PC on the Defense Department intranet can be upgraded to support the system, Glass says.

Although comparatively low end, desktop videoconferencing products deliver relatively good performance. On an intranet, you should shoot for a product that can support at least 10 frames per second. Frame rate, the rate at which the screen image is updated, defines the acceptability of the system.

The lowest acceptable rate is five frames per second. At this rate, movements can be detected at the remote scene, but they look jerky. If your intranet connections ride over a lightly loaded Ethernet LAN, you could expect to get about 30 frames per second.

CONFERENCE CLUES

- Ethernet wasn't designed for use with the kind of traffic generated by desktop videoconferencing, so bandwidth may be a problem when tens of users per segment start videoconferencing.
- Know the average loading characteristics for your network before adding desktop videoconferencing. Then, as you roll it out, monitor traffic growth.
- Some desktop videoconferencing products allow maximum bandwidth usage to be preset, but even then take care the network doesn't saturate. Determine a system's bandwidth demands, particularly for multipoint applications.
- Educate staff on using desktop videoconferencing prudently from the viewpoints of content, applicability and frequency of use.

Gaps in sound may occur if your IP connection suffers from packet drop-out, which usually slows the frame rate but does not stop the display.

Product image resolutions vary from 160 by 120 pixels to 352 by 288 pixels. While small, these sizes are adequate for conversational purposes. Plus, they don't take up much screen space.

Other considerations are whether the system operates in a point-to-point or multipoint — one-to-many or many-to-many — mode, includes a directory service and conforms to standards.

The International Telecommunication Union's H.32X standards are important. They define ways these systems can communicate. NetMeeting and Intel Corp.'s Internet Video Phone

are examples of products that conform to various H.32X standards.

It's time to start testing products and get network performance benchmarks on a segment-by-segment basis. Then you'll be able to track the impact desktop videoconferencing makes on your intranet and be in a position to plan for growth. ☐

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INTRAVIEW
&
**On NCs
and the
intranet**



A network computer (NC) or a thin client — call it what you will, this new-fangled desktop device comes to market with more than the usual share of bigotry and bashing. Bob Dies, general manager of IBM's 6-month-old Network Computer Division, cuts through the banter to assess this technology. NCs and intranets fit hand in glove, but not to the exclusion of dumb terminals, or even NetPCs, Dies says in this interview with Beth Schultz, IntraNet's managing editor.

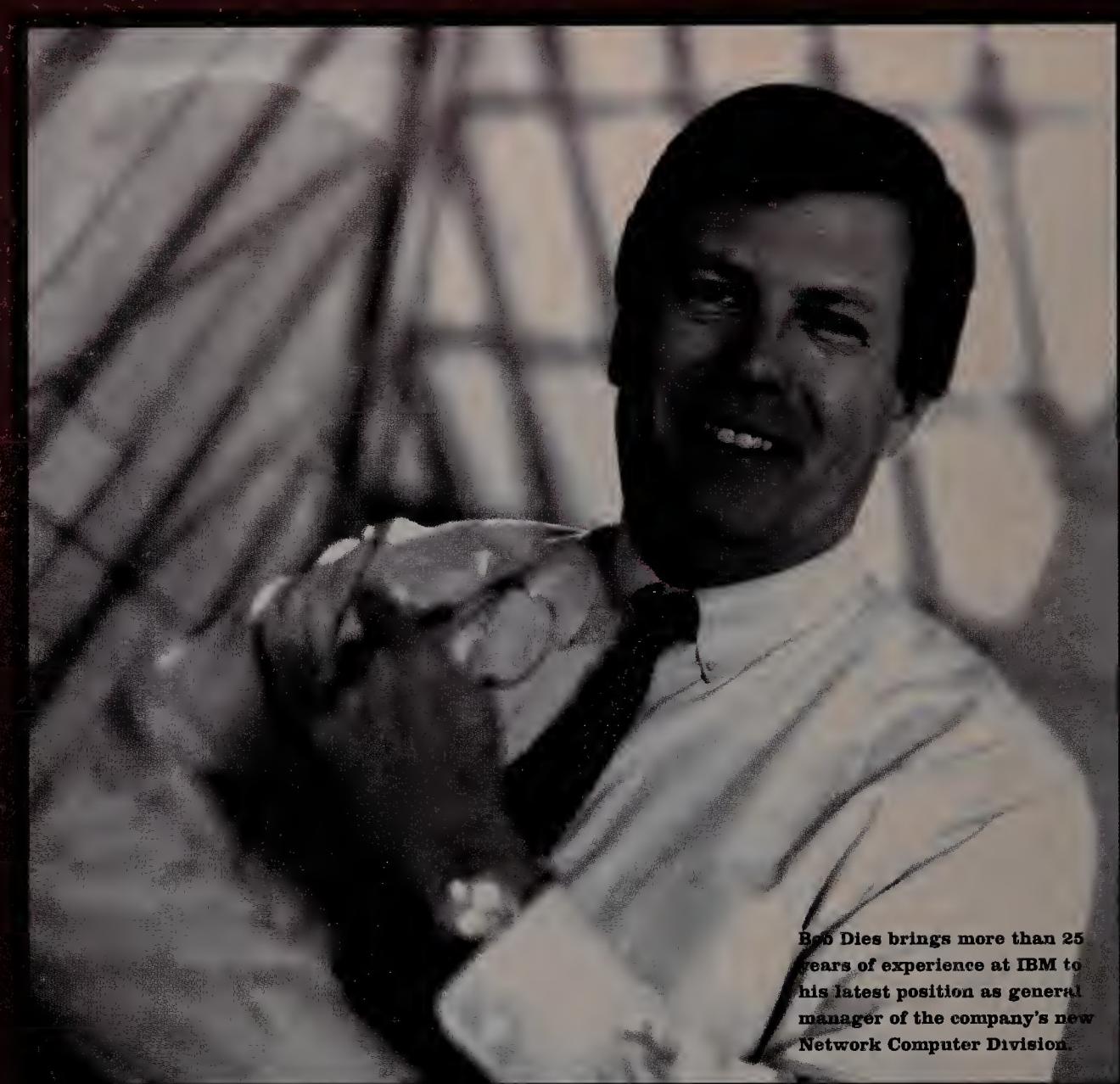
We've heard various industry personalities, depending on their technical leanings, talk NCs up or down. What brings IBM into this fray?

Well, the objective here is to eliminate complexity. Most corporations — the ones with intranets, certainly — have an existing suite of applications. They're not going to rewrite all of those in Java, in C++ or in anything else. So the first design point is: Let's make it so that the network computer can connect into the existing array of corporate applications across intranets.

When you turn on your network computer in the morning, you can hit a router and go straight off into the network for your intranet application or your 390, AS/400, Unix or whatever connection, as opposed to having the workstation connected to a server and every time you want to go someplace, you have to go through that server.

What are some of the other advantages intranet users get from NCs?

I'm an intranet user, as you would hope. My headquarters is up on the thing. When we formed the Network Computer Division and moved buildings, I had them come in one weekend and take out the Pentium PCs and put in Network Stations. Now what they did in preparation for that is they had to go back and see what each person was using. In my case, that was Lotus [Development Corp.'s] Notes and SmartSuite, Netscape [Communications Corp.'s]



Bob Dies brings more than 25 years of experience at IBM to his latest position as general manager of the company's new Network Computer Division.

CHRISTOPHER WEL

browser and 390 applications. They took my data off the hard disk, put it on the server — a PC server in this case — and removed my PC.

So when I came to work on Monday morning, my Pentium was gone and there was this little black box sitting on the desk. And my secretary walks in and her PC is gone, and a Network Station is sitting on the desk. And she panics, of course. All the things she has to do every day were on that PC. But then she turns on the monitor and the good news is, well, they didn't steal the icons. All the icons she uses were still on the screen. The difference is you don't keep a full copy of every program on every workstation in case you happen to be wanting to use it. You keep one copy of the program on the server and share the usage.

After they took my Pentium out, I said, 'Now go tell me what's on the hard disk.' What was on my hard disk was 245M bytes of application software, 145M bytes of operating systems — OS/2 and Windows 95 — 45M bytes of browser and 10M bytes of Bob Dies, meaning my word processing files. Now do you want to keep more than 400M bytes of application software, operating system and browser stuff on every desk or do you want to keep one copy on the server and then make it available to everybody?

With network computers, the question is: 'How efficient is it to run Microsoft Word from a server as opposed to physically dedicating it on my desktop?'

To answer that question, I did an interesting little benchmark with the fellow I report to. I brought him into my office and showed him all

See Intraview, page 33

of a network, a client/server-type environment, without the headaches. It gives you the ability to deploy whatever you choose more easily."

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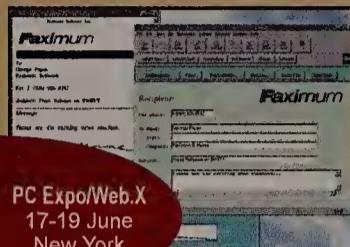
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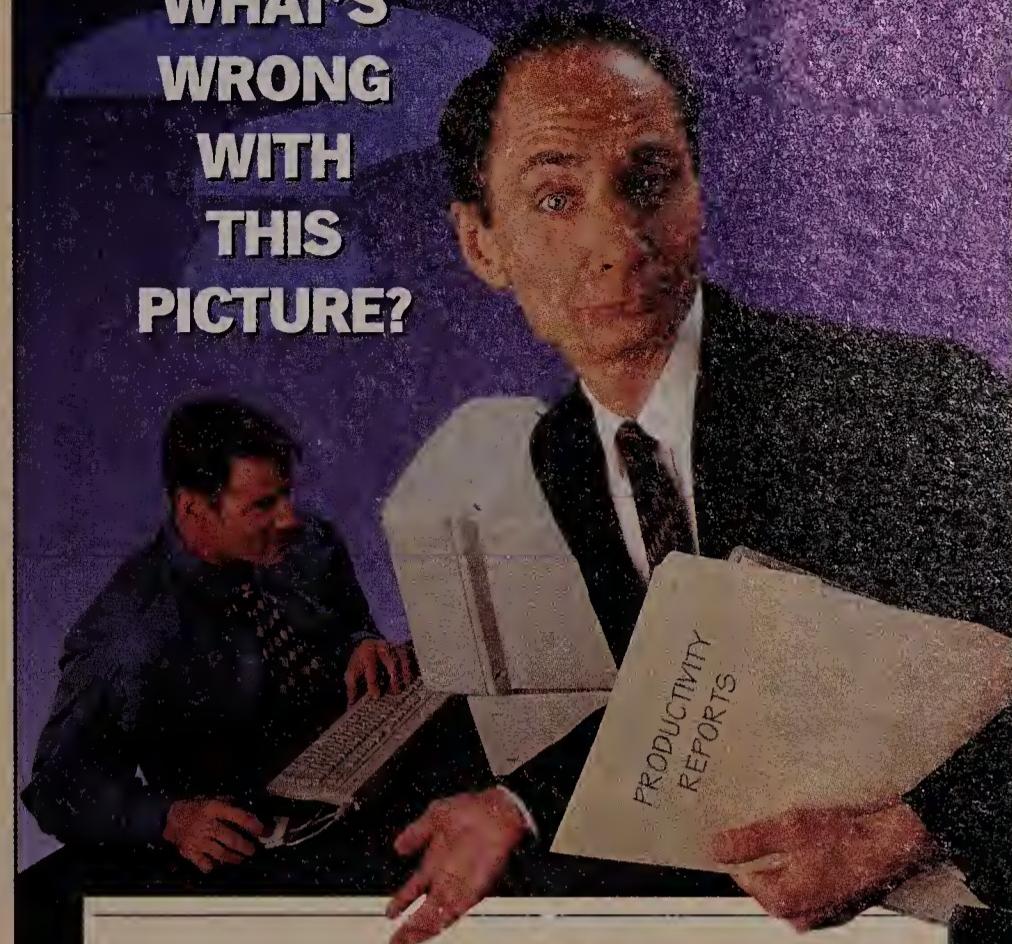
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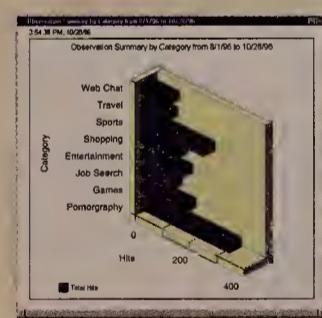
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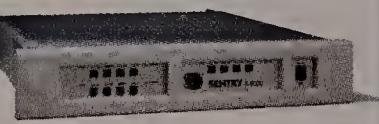
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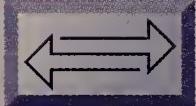


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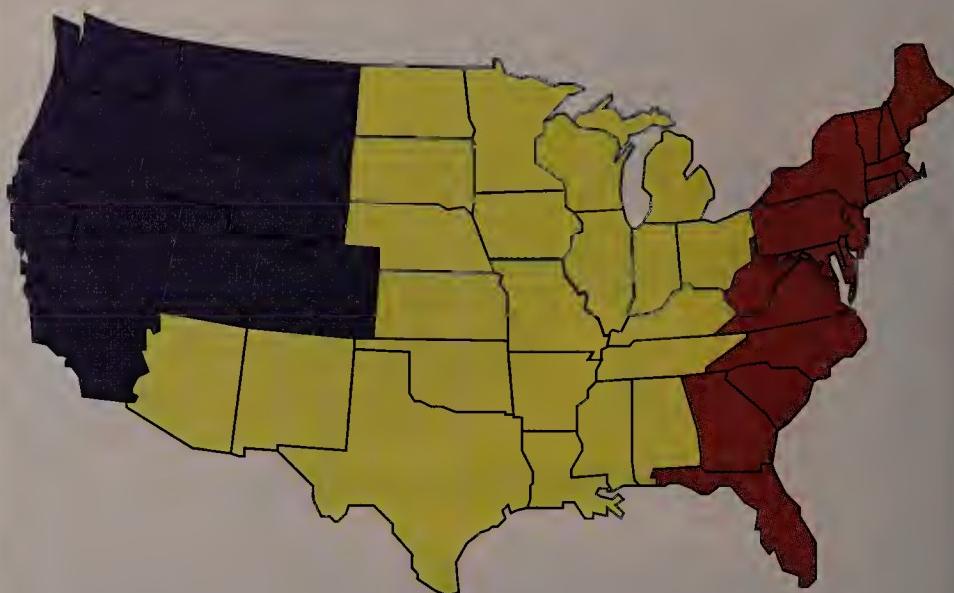
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With a network computer, you don't go through the economic trade-off that some companies go through to decide how much function they'll make available to which people in the organization. You still have a management decision of who needs what and do I make it available. But you don't have the economic inhibitor of trying to justify it by changes in the desktop

INTRAVIEW

Q&A

Continued from page 30

the stuff I did with the network computer using servers around IBM. And he says, 'I don't do anything but what you do, so get me one on my desk. I don't need the Pentium.' I went in later, and he's still got his Pentium on his desk because he loves it. So we decided to bring up Notes 4.5 on the Pentium and the network computer, and guess what — the Network Station executed the command faster.

I'd say it's obvious you believe NCs and intranets were made for each other. But why do you think that exactly?

With intranets, there is finally a set of standard protocols — IP, TCP/IP, whatever you want to call it — that allows all these things to work together without us having to worry about all of the communications. That's a real plus. Another thing is that most of the applications are groupware and need to be shared. They are not centric to the desktop. So the question for the corporation becomes: 'How do I give my people access to the data that's around the company in an easy-to-use fashion without having to buy a Mack truck or a Pentium, or worry about the time and complexity of upgrading?'

A real-life example of this inside our corporation is when we bought Lotus two years ago. Notes is what we wanted, and we said, 'OK, Notes is it. Everybody goes to Notes.' But it took a year and a half. It wasn't a question of money. It wasn't a question of desire. It wasn't even a question of technical competence — we have some of that. It's because we had to go to every user and figure out if Notes would fit on the desktop.

In the network computer paradigm, I would have taken one of the servers — Unix or PC server or an AS/400 — and I would have put Notes on that, made sure it was available. And then I would have checked it in your profile, so when you wake up in the morning, there's an icon on your screen that says Lotus Notes.

A year-and-a-half rollout isn't ideal, but it allows time for training and spreading out costs. How does a company cope if hundreds or thousands of users get access to a new application overnight?

Network computers do not solve the problems of a poorly or well-written application. And they don't necessarily change software pricing, how much you'll be charged per seat for Microsoft Office. The point is: We can have all of the benefits of a network, a client/server-type environment, without the headaches. It gives you the ability to deploy something — whatever you choose — more easily.

The cost of ownership is clearly one of the advantages of network computers vs. PCs and other products. Network computers are radically simpler and a lot cheaper. That's what the larger customers, the people with the intranets and the global networks, want to talk about, so we get focused on that. But that probably isn't the biggest advantage. The biggest advantage is how fast you can deploy the new technology and applications.

expense of going to \$5,000, \$8,000, \$10,000, \$13,000 per-year, per-station PC costs. A network computer might cost 25% more than a nonprogrammable terminal but wildly less than a PC. In the same category are those people who have PCs doing fixed-function things. You know, I have a PC because of the graphical interface and I want to connect



What if I had a killer application for my business vs. the competition, and I had to spend six to 18 months rolling it out rather than rewriting the front end. And once you get it right, everyone has access to it. That's the advantage: that you can deploy things quickly. Put one copy on the server, and then open up access.

Does an NC deployment require a change in the server environment?

It could. You know, there are a lot of misconceptions about network computers that other people want to propagate for their own reasons, mostly in the Wintel world. One of the things is an implication that it's necessarily true that whatever the applications are to the servers, it must take a lot bigger network and much bigger servers. But it depends. We've done some preliminary work and found in our research organization a 1% overhead with the network computers.

Did you find anything else of note?

Our research team found it likes the Network Station for a reason we didn't expect. A researcher could be anywhere in research, go to a desktop, put in his ID and, because the Network Station goes to the server and says, 'OK, here's what he does, here are his personal files,' his desktop shows up wherever he is in the research organization. With a PC, your data, the last revisions, are locked there. Network computers aren't mobile like a ThinkPad. But it's a mobility that within my intranet, within my organization, on a local basis, I can use any of the workstations and have my personal desktop show up.

Which customers are interested in NCs?

One set of customers will be those that have fixed-function displays — the 3270s, X terminals and server connection stuff. And they say, 'I've got to get into the new world of graphical user interfaces and browsers and Notes and things like that. But I really don't want the

into multiple servers. There will be lots of those customers.

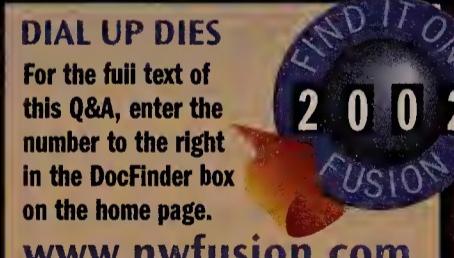
The other category of users are companies that are realizing more of the applications they make available are based on servers, networks and the intranet. And you neither want the expense nor cost of the desktop with a PC. More importantly, you want to be able to add and delete applications, deploy them without the headaches. So cost is a big deal, speed of deployment is probably a bigger deal long term.

With a network computer, because you're putting the application on the server, you don't go through the economic trade-off that some companies go through to decide how much function they'll make available to which people in the organization. You still have a management decision of who needs what and do I make it available. But you don't have the economic inhibitor of trying to justify it by changes in the desktop.

So we've got these NCs, what becomes of all the dumb terminals and PCs?

Here's a conceptual point: Televisions didn't obsolete the movies, but it did change them. You don't go to the movies for the newsreel like your parents did. So network computers won't obsolete dumb terminals or PCs. Dumb terminals are always going to be the least expensive and the least functional. This is a little more expensive with very high function. PCs will end up in the space where most of what you do is centric to your desktop. And let's not forget the NetPC, which is a sealed PC. It has a hard disk, but we've taped over the diskette drive. It's for fixed configurations. But you still have the software at the desktop and the issues of upgrades and performance. NetPCs can be advantageous when you've written your application to use the unique personality type of the PC operating system.

There are some radicals in the world who say, 'PCs are dead. Let's replace them.' That's crazy. Companies will mix and match these things. They'll have TVs and go to the movies, too. ■





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Setting the Social Scene

ave a nice day," "Have fun" and, worst of the lot, "Take care." These phrases are trite, aggravating, irritating and, because they are said automatically, utterly devoid of meaning other than the implicit declaration: "I don't want to talk to you anymore, so I'm closing the conversation. Now please go away."

I even have to note, with great distaste, the peculiar trend to weave these expressions into new software packages. It seems the instructions for every other package I open includes the exhortation: "Have fun" or, even worse, "Above all, have fun." Ugh.

These phrases, although delivered by rote, are some of the interpersonal conventions by which we live — niceties that oil the wheels of social interaction.

We have few such social conventions for expressing ourselves in the online world, except trivialities such as smileys, as in :-). While the general online world can function with a rudimentary virtual social ethic, some guidelines for an internal Web are in order.

The scope of intranet communications is covered by real-time data delivery, such as chat services and teleconferencing, and store-and-forward services, including Web servers and E-mail. Each creates its own setting and demands different social skills.

Perhaps the trickiest of these media is E-mail — a minefield of social banana peels. I point to one of my own experiences as an example:

Many years ago, when I worked for Novell, Inc.'s operation in England, I was trying to get some information out of a product manager in Utah. After several unproductive attempts to get his cooperation, I sent him an E-mail message that said something along the lines of "Get off your dead..."

I received the following reply from his secretary, to whom I had copied the message: "I resent the letter you sent to Fred."

I, of course, phoned her immediately and launched into a diatribe: "What do you mean you resent my message! You're not his mother! Just get on and do your job." As I reached full speed, she managed to break in, saying, "Actually, what I wrote was I *re-send* what you sent to Fred."

Until then, I had no idea how good I was at groveling.

Sure, over the next couple of years videoconferencing and video mail will make such misunderstandings and embarrassments a thing of the past (although I suspect we'll find whole new ways of fouling up). But for the near future, we're going to have to deal mainly with text-based communications.

What about on intranet pages? What social norms apply?

Well, to bang a drum I've beaten previously, unless you've told your intranet users what you expect of them (and this applies to

E-mail as well as every other intranet service you run), they will have every excuse to do things that will, at best, irritate you and, at worst, cause serious problems.

Irritations can be as prosaic as sending messages to the "everyone" list about how many kittens Fluffy just had or as stupid as replying to messages sent to everyone with "Yes" or "No" and copying the list.

Problems can run the gamut from crashing the mail server because too many messages are being sent to everyone to creating internal Web sites for the distribution of cracked software or pornography.

One of the qualities of the online world is what I call "virtual ego." Just as we have a real home in the real world and a virtual home (a home page) online, we have one persona in the real world and another online. The latter, more often than not, is one's evil twin and so is often the source of problems encountered online.

I suggest the following five basic tactics to help establish an intranet social environment in which online personality traits such as aggression or inappropriateness aren't tolerated. They are:

- Tell users what the standards of behavior are for the intranet and explain why they've been chosen. An important part of this exercise is to make your policy on sexual harassment clear. If you fail to articulate that the online and real world are governed by the same rules, virtual egos will lead users to post and publish unwisely.

- Embody your standards of behavior in formal rules that have teeth — disciplinary consequences for violations. This is often overlooked. Its importance will become all too clear when you, the IT manager, are faced by a user who responds to your admonishment by saying, "Yeah? So what?"

- Act promptly upon breeches of the rules. This is standard human resources practice, but in IT, the pressures of the job often mean deferring such tasks because another, bigger fire needs to be extinguished.

A simple hand-off to human resources will suffice, but you'll have to plan for it.

- Ensure that all management faithfully and completely obeys the rules. If managers lapse, staffers will think they can, too. It is particularly important that the CEO and president are committed to the rules.

- Monitor content. Make sure you know the kind of data being placed on your Web servers and being sent in E-mail messages. Obviously, monitoring everything is not practical. But once employees know monitoring is a possibility, 99% of the problem vanishes.

These guidelines aren't hard to introduce or follow, provided you address the issue early in your intranet's life.

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S P E C I A L F O C U S

Web site development

The right tools for the job

Web site developers say no tool does everything, so they must pick and choose.

By Carol Sliewa

One Web authoring tool simply doesn't suit all the needs of the developers who produce the *Los Angeles Times* Internet site. So the group is taking a carpenter's tool kit approach.

"[The developers] apply different tools to different aspects of the job, rather than trying to drive screws with a hammer," says Lemont Southworth, systems-operations manager of new media at latimes.com. "They'll use the one that fits best."

Tools span a variety of categories, and choosing the best tool to address a problem depends on the developers' level of sophistication and the results they want to achieve.

If creating static text-based Web pages is the goal, a common word processor such as Microsoft Corp.'s Word or Corel Corp.'s WordPerfect might be enough for simple conversion of documents to HTML.

In fact, any document created in Microsoft Office, whether an Excel spreadsheet or an Access database file, can be displayed as HTML. For many developers, Microsoft's NotePad also is a helpful tool for simple text editing.

But developers who want more functionality in a Web authoring tool will have to sift through scores of other products. Microsoft's FrontPage, Netscape Communications Corp.'s Composer and Adobe Systems, Inc.'s PageMill are a few of the user-friendly, visually oriented tools.

"Not being a technical person, I don't ever want to use HTML," says Tob Seven, a FrontPage user who created a Web page for helping small business owners advertise on the 'Net. "I just wanted to get up a Web site in a few days, and it was possible with no prior experience with HTML."

It's a full-time job

Full-time Web content creators, on the other hand, tend to like to get at the source code. Although they can do that with a tool such as FrontPage, many tend to opt for products such as Sausage Software's HotDog and SoftQuad, Inc.'s HotMetal.

John Pike, director of cyberstrategy for the Federation of American Scientists in Washington, D.C., uses HotDog for creating tables and Luckman Interactive, Inc.'s WebEdit Pro as a coding tool. He's also looking into NetObjects, Inc.'s Fusion and Adobe's SiteMill for site design and link management capabilities.

"The [tool] that's most popular might not be best for you. It depends on what you're trying to do," Pike says. "The good news about [these tools] is that you can download most and try them out."

Usually, they're not that expensive, so it's not like you're buying a house or something."

What's good for a PC user like Pike may not be available for Macintosh devotees. Dominique Ellner, a loyal Macintosh user and production director at New York-based Agency.Com, is a fan of the Macintosh-based BBEdit text editor offered by Bare Bones Software, Inc. in Bedford, Mass.

But like PC users, Ellner keeps a virtual toolbox at her disposal. She gets plenty of use out of Adobe's PhotoShop image editor and Illustrator vector graphic creator, assorted shareware and homegrown tools.

stored in their databases, while others want to build more interactive applications.

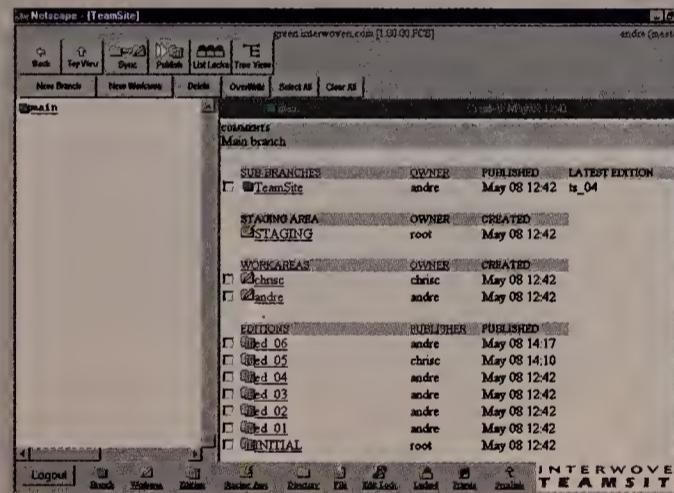
Tools to help build interactive applications include Microsoft's Visual InterDev, Netscape's Visual JavaScript, NetDynamics, Inc.'s eponymous tool, Bluestone, Inc.'s Sapphire/Web and HAHTsite from HAHT Software, Inc. And that's not including increasingly popular Java development tools.

For now, a tool that does everything a developer wants is virtually impossible to find.

"The problem is that the [Web server and browser platforms] keep changing so quickly that no matter how new a [development tool] version you

QUICK TAKE: TEAM SITE

Interwoven software manages Web site contributions



As large Web sites with thousands of pages become more common, demand for tools to orchestrate contributions to those sites should increase. Silicon Valley start-up Interwoven, Inc. this week will join Wallop Software, Inc. and Mortice Kern Systems, Inc. in addressing this customer need.

Interwoven's first product, TeamSite, helps content contributors work simultaneously on an Internet or intranet site. Development teams get a virtual copy of their Web site, so contributors can work independently on different branches of the site. Shared staging areas let developers see what their colleagues have been doing. The software also automates the process of merging the branches.

TeamSite runs on Solaris 2.5, but plans call for Interwoven to port its software to Windows NT later this year. Any standard Web browser will work as the client. A typical TeamSite starter configuration with support costs \$62,000.

Interwoven: (415) 917-3600

As a producer of large, complex Web sites for companies such as British Airways and American Express Co., Agency.Com also is considering the addition of a Web site management tool, such as Interwoven, Inc.'s new TeamSite offering, Ellner says. (see Quick Take).

Tool evolution

As Web sites have evolved, so too have tool offerings. Now the software not only provides help with content creation and design, but also with the development of complex database-driven Web applications.

"You will see new tools that make it easier to build [Web] applications" as software components become more popular, says David Folger, a META Group, Inc. senior analyst. "Pretty soon, the publishing department can assemble components to add functionality to content, such as making [the content] active, adding a click box. Two or three years ago, that would have had to be done by a programmer."

Database-driven applications are becoming an increasingly important consideration. Some content creators simply want to publish information

get, [the tool] still doesn't support some of the things that are available in the latest and greatest browsers," says Patrick Naughton, president and chief technical officer at Starwave Corp. "Tell me about a tool that has support for dynamic HTML today. It doesn't exist."

Naughton's Bellevue, Wash., company produces high-profile Web sites — such as ESPN SportsZone and the new ABC News site — that require cutting-edge technology to display dynamic content. While only a handful of Web developers face the sort of dilemmas Starwave developers confront, even those who don't require the newest technology face tough decisions when sifting through the myriad offerings.

Eli Lilly and Co., for instance, plans to adopt tools to allow its end users to produce Web content for the company's intranet.

"The reason we haven't standardized [on a development tool] yet is that we see [the tool] marketplace as too dynamic," says Dann Veldkamp, an Eli Lilly senior systems analyst. "We would be unable to make a decision that we could abide by for the long term." ■

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Technology Update

Covering: Evolving Technologies and Standards

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At our headquarters, we have NetWare 3.12 servers, DOS/Windows 3.11 workstations and a few Windows NT servers running on a token-ring network segmented into several rings.

We recently upgraded 20 users to Windows 95 PCs, all of which are connected to the same token-ring segment. Since then, we have had three incidents of workstations on this segment being unable to insert into the ring.

My Fluke Corp. LANMeter indicates a problem with the parameter server, but I haven't been able to identify which PC is configured as the parameter server. However, I think I've narrowed down the problem to one of the Windows 95 PCs.

Vince Romero, LAN administrator, Brooks Brothers, Inc.

Isolating the parameter server may require a lot of work. You may need a product like Novell, Inc.'s LANalyzer, which will let you look at the network traffic on the wire and give you the ability to perform rather detailed protocol decodes. You may be able to identify the workstation functioning as a parameter server from the frames crossing the wire. They will show which station is a parameter server and what information the sending station is putting on the wire.

When the insertion problem comes up again, check the servers for beaconing messages, which could indicate a bad cable, a faulty network card or possibly a LAN driver that needs replacing. One of these problems could cause workstations not to be able to insert into the ring.

Because you've isolated the problem to the 20 Windows 95 workstations, examine their network cards. It'd be worth your while to get the latest net card drivers, as well as the most up-to-date version of Novell's Client 32 for Windows 95.

You also could test the ports of the multistation access unit being used. One of the ports may not be opening or closing properly when a workstation attempts to insert into the ring.

NDMP: Beating the backup blues

The Network Data Management Protocol Task Force continues enhancing the widely supported protocol for backing up data on a network.

By Richard Boberg

When it comes to ensuring interoperability among different servers and backup software, the Network Data Management Protocol (NDMP) Task Force means business.

The task force is working on enhancements to its NDMP specification, which defines backup over the network from a network storage node to a backup media node. This is all controlled by the backup host. Released last fall by codevelopers Network Appliance, Inc. and Peripheral Devices Corp., NDMP Version 1 is endorsed by more than 25 vendors of file serv-

ration control, scheduling of various backup levels, tape media management, tape device control, autoloader robotics control, automatic discovery of the storage and backup media environment, and user interface to easily administer and monitor the backup process.

Backup also is heterogeneous. IS departments use many varied platforms and operating systems.

Decisions made at department, workgroup and project levels usually result in many different types of systems over time, but backup is often considered a centralized function that calls

backup-ready network-attached storage — they don't want to have to install backup agents.

However, the administration and control aspects of backup are usually not the core competency of the storage vendor. Storage vendors have to rely on third-party backup vendors to solve the complex aspects of backup.

Backup products vary, but most vendors' architectures are similar. Backup software on a centralized backup host can, over the network, direct a file server to send its data to a backup device, typically a tape or tape library.

Go online for more NDMP information:
Protocol specifications
A listing of NDMP supporters
Order form for the developers' kit

www.nwfusion.com

interoperability.

NDMP addresses the problem of backing up networks of heterogeneous file servers, such as dedicated file servers, with several backup applications. Previously, backup vendors were required to port to and track many different platforms and operating system releases.

Now NDMP-compliant centralized backup administration applications can use an NDMP universal agent in the network-attached file servers.

The dedicated file server vendors must only be concerned with maintaining compatibility with one well-defined protocol. The backup vendors can place their primary focus on the sophisticated central backup administration software.

In place of the many proprietary and incompatible vendor-specific backup protocols, NDMP is an open protocol providing backup control and data primitives that can be used by all backup software and file servers.

The result provides powerful solutions to the problems of network administrators, file server vendors and backup vendors.

Boberg is senior director of strategic marketing at NetApp, a dedicated network file server company in Santa Clara, Calif. He can be reached by phone at (408) 367-3017 or via the Internet at rich@netapp.com.

Need information?

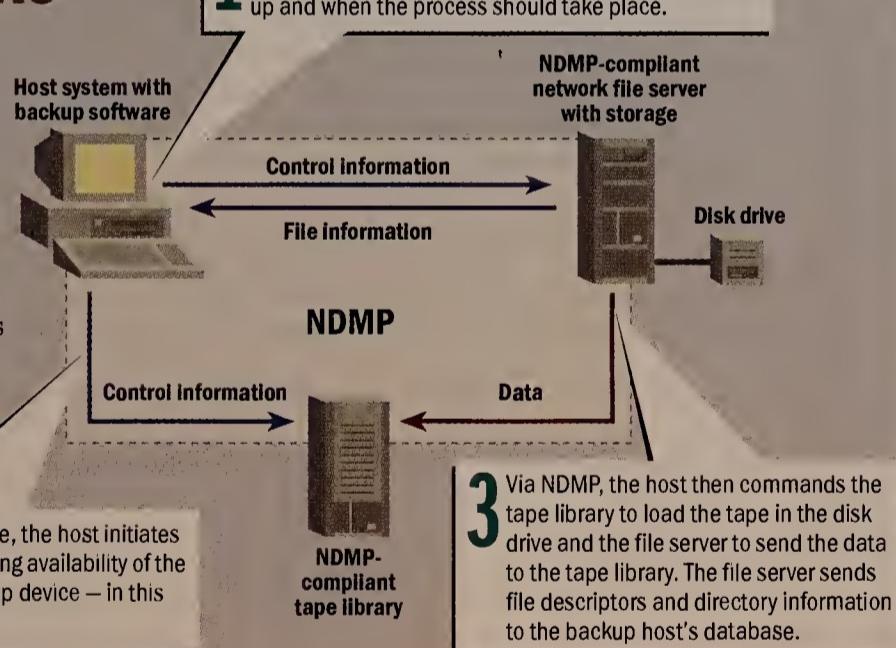
Let *Network World* provide a quick primer on an important emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (773) 283-0213 or via the Internet at bschultz@nwfusion.com.

HOW IT WORKS

NDMP-based backup

Using the Network Data Management Protocol (NDMP), host software can control the process of backing up files from file servers to a network-attached storage device. The NDMP ensures interoperability among the software, file servers and tape libraries even if they are from different vendors.

2 At the scheduled time, the host initiates the process by verifying availability of the file server and backup device — in this case, a tape library.



ers, backup software and tape libraries.

The enhancements will allow backup data to be directed to any NDMP-compliant network node. This gives the network administrator the ability to locate the backup device on the backup host or on a third node on the network, resulting in a three-way backup architecture.

Backing up on backup

Backup is complex. Network-based backup administration software offers an array of capabilities. These include configu-

for an enterprise-wide solution.

File servers must be backed up for disaster recovery and historical file recovery purposes. Administrators want the flexibility to choose the best backup solution to fit their particular requirements.

Administrators would like to be able to mix and match their choice of backup software with the array of file servers they use. However, the proprietary backup agents often are not ported to all of the file servers that must be backed up.

Administrators also want

The tape device may be physically attached to the file server host or backup host.

What is NDMP?

The NDMP Task Force launched its initiative in order to create an open standard protocol for network-based backup for network-attached storage. The protocol allows backup and network-attached file server vendors to focus investment on functionality instead of excessive porting.

It also gives users an unprecedented level of choice and



EDITORIAL *insights*

Of tele-smell and other oddities and marginalia

Chalk it up to the parched desert heat or the din of the Net-World+Interop 97 show floor. My mind is clogged with bizarre thoughts that I must purge before I can address more serious issues.

Case in point: the stinky network. We've got text, audio and now video streaming over our networks. What's next in multimedia? Why smell, of course.

First Wave, Inc. of Scottsdale, Ariz., has pioneered the concept of smell kiosks — touch-screen kiosks that allow you to call up information about that new luxury sedan you've been eyeing and get a whiff of its supple leather seats. The company calls this "omnisensory merchandising," and says you can expect to see these kiosks in upscale shopping centers or hotels, where you could smell the inviting scents from a swank restaurant.

Because nature abhors a stand-alone computer (or omnisensory kiosk, for that matter), there are people exploring the idea of transmitting smells over the Internet. If you don't believe me, do a search on "tele-smell" on Alta Vista.

One application of tele-smell is in telemedicine. It would be helpful for a doctor to get a whiff of, say, that fetid, nasty-looking growth on your foot while eyeballing the appendage over a video hookup.

You can explore the tele-smell concept in a paper found at

www.emsl.pnl.gov:2080/docs/cie/neural/projects/health-slides/pg1.html. I recommend you go directly to slide 20, where you can see a prototype tele-smell system in action.

What worries me is the thought of getting tele-smell attachments in incoming E-mail. This leads me to the idea of video junk mail.

Tired of all that unwanted commercial E-mail with those nasty attachments? Just wait until someone starts sending video attachments — read unsolicited commercials.

Face it, it's only a matter of time before one of the big junk E-mail outfits latches onto this idea. Click on that attachment, and you'll be treated to a video shill hawking the latest investment scam or vacation property. Remember, I warned you.

And, finally, while looking up at the stars in the Nevada night sky, I was reminded that their light is only now reaching us after millions or billions of years. This means that if you were to race out into space at Warp 100, you would actually be able to witness again some of the great events in IT history. Novell buying Unix and WordPerfect. Microsoft announcing LAN Manager. IBM buying ROLM and backing OS/2. Videotex warmly embraced. Omnisensory kiosks launched.

OK, I lied. You can't see the stars from downtown Las Vegas. But the rest is true.

John Gallant, editor in chief

jgallant@nww.com

Enterprise Networking • Lance Boxer

Getting the most out of IT: Sound advice from MCI's CIO

No one ever said the role of the IT professional is easy. The IT person at the top of the corporate ladder, the chief information officer, worries about being effective as a business executive while simultaneously blending IT disciplines into the network and telecommunications infrastructure.

I've learned some lessons from the real world of on-the-job IT on the way to becoming CIO of MCI Communications Corp.

For one, it's hard to ensure that the CIO role remains relevant to the business and the people making the business possible. Popular wisdom holds that you should align the IT function with the business, decentralize the IT department and distribute the CIO's responsibilities. Not exactly inspiring.

So how do you go about streamlining your IT organization without dismembering your job?

First, develop an IT strategy driven by overall corporate goals. Whatever your industry, IT must be used to deliver business benefits: increased speed to market, improved customer satisfaction and smaller, more efficient operations. At the same time, job satisfaction for the network and IT professionals who make the strategy a reality must be a consideration.

Configure the IT organization to reflect the way customers use your company's products. By focusing efforts to meet external — not internal — demands, IT can mobilize and deliver what customers want a lot faster.

But internal demands such as state-of-the-art software, hardware and services are important, too. Ensuring that tools are available internally so IT teams can make the most productive use of their time must be a part of the overall methodology.

This often requires moving from an IT organization structured around business lines or product groups to a more collaborative setup, leveraging development efforts across multiple projects. To move away from this "islands of expertise" approach, everyone needs to communicate and cooperate in order to collaborate, not duplicate. Results include more productive product development, service rollout and customer support.

For the IT team, this increases job satisfaction and acts as a catalyst for cross-training and learning.

Another way to help the transition is to change incentives. Instead

of compensating programmers based on how much code they crank out, reward them for how much code can be reused. This better leverages scarce programming resources in a component-based application development environment.

Rethink how you measure IT's business value through metrics such as speed to market, increased customer satisfaction and other operational indicators.

This does a lot to align IT with business goals. In many industries, speed to market is everything because a fraction of a market-share point can translate into millions of dollars.

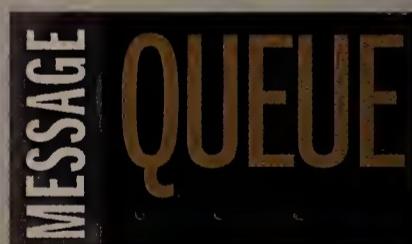
To get our products to market faster, MCI adopted a "staged development" methodology.

Stage 1 is speed: getting the product out the door as soon as possible. Stage 2 is scalability: adding capacity to handle the demand from successful Stage 1 launches. Finally, Stage 3 is the traditional application endgame: full documentation, with all the kinks ironed out.

In IT and networking, the name of the game is "be prepared for anything."

IT needs the flexibility and dexterity to implement just the solution the customer is going to demand in the shortest time frame possible. And by remembering the guys in the trenches, the CIO can streamline business IT processes in the most empowering and effective way — which is what streamlining is all about.

Boxer is CIO at MCI, where his 8,000-person organization provides the operational infrastructure for MCI's business, global backbone and IT systems. He can be reached at (972) 918-5585 or via the Internet at 3613667@mci.com.



Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Puzzling position

I'm a little puzzled by your editorial, "The milk mustache of security" (April 14, page 48).

First, contrary to your comments, the credit card companies — MasterCard International, Inc. and Visa International, Inc. — at least are vigorously promoting fraud-resistant security for Internet applications through the Secure Electronic Transaction (SET) protocol, a spec they developed. SET isn't a ubiquitous part of applications right now, but given its backers — which include IBM, Netscape Communications Corp. and Microsoft Corp. — it probably will be within a year or two.

Security efforts show promise, with one caveat

Users need integrated security systems that provide a consistent set of security services across network hardware and software, including operating systems and key applications.

Two recent vendor initiatives are targeting this need.

Last month, 3Com Corp., Bay Networks, Inc., Hewlett-Packard Co., Ipsilon Networks, Inc. and Xylan Corp. were among the network vendors that joined with 75 other companies in the Open Platform for Secure Enterprise Connectivity (OPSEC) Alliance.

Spearheaded by Check Point Software Technologies, Ltd., OPSEC is a technology initiative based on Check Point's FireWall-1 product. The alliance's goal is to guarantee interoperability between security applications.

OPSEC defines an open, extensible management framework that supports a combination of published APIs, industry-standard protocols and a high-level scripting language. Once security applications are integrated into the OPSEC framework, you should be able to configure and manage them from a central point—currently, Check Point's management platform—based on an enterprise-wide security policy.

Meanwhile, Cisco Systems, Inc. earlier this year launched its Enterprise Security Initiative. Like OPSEC, Cisco's initiative defines a framework and emphasizes the ability to implement, manage and monitor an enterprise-wide security policy. In addition to centralized administration, Cisco's initiative aims to provide dynamic links between an organization's security policy, user or host identity, and network infrastructure.

The goal of Cisco's initiative is to tie security policy to a user's identity, rather than a host location. If the initiative fulfills its promise, organizations will be able to integrate multiple technologies, such as Remote Authentication Dial-In User Service, digital certificates and Windows logon operations, to establish a set of user privileges that apply no matter where a user connects to a network.

In support of the initiative, Cisco will roll out a set of tools, new capabilities in its switches, routers and firewall platforms as well as new security products. In addition, Cisco is extending the framework to other vendors through an alliance. Currently, this alliance has only a handful of members, including Microsoft Corp. and Oracle Corp., which are also members of OPSEC.

Although these alliances may represent more smoke than fire, they are a step toward integrated, comprehensive security systems. Neither alliance will solve the entire security problem, but they will offer customers alternatives to the security mishmash.

Meanwhile, the Internet Engineering Task Force (IETF) is furiously working on some other pieces: the IP Security protocol, Internet Security Association and Key Management Protocol and Public Key Infrastructure (X.509), among others. The IETF's efforts have already produced some sound security standards for developers, with more standards probably being published in the next four to 12 months.

The World Wide Web Consortium has been working on other critical pieces of commercial security technology, including Protocol Extension Protocol, Platform for Internet Content Selection and the Digital Signature Initiative. We'll probably see the initial results before the year is out.

Now here's why I'm puzzled: Despite this beehive of activity, you believe the way to get anyone seriously interested in Internet

security is some glitz, high-profile, low-content marketing. I really think you need to get out of the office more often.

Bede McCall
Bedford, Mass.

Directory assistance

Regarding Dave Kearns' column, "Novell answers Windows directory call" (April 7, page 22): There is another directory service that can bring all your NT servers, as well as Unix and NetWare, together as one logical entity.

It's a shipping product, available for more than a year, that allows you to create the largest NT network without the hassle or complexity of domains.

It also handles TCP/IP and directory integrated messaging. And its cost of management has been repeatedly shown to be the lowest in the industry.

What is it? Banyan Systems, Inc.'s StreetTalk.

StreetTalk for NT is a real-world, highly scalable solution for NT networks—or any network, for that matter.

And it's here today. Although virtually ignored by the press, it does what everyone seems to be asking for: It unifies NT resources in a single directory.

David Rusting
Network manager
University of Michigan
Ann Arbor

E-mail's not the culprit

The evils described in your article about macro viruses ("The virus is in the mail," April 21, page 1) were laid on the doorstep of E-mail, when the real culprits are the latest versions of Microsoft Excel and Word.

The solution is simple: Don't use the latest versions of Excel and Word.

It is not necessary to cede one's entire desktop to Micro-

Various forces are driving the need for more comprehensive security, but none more strongly than the deployment of intranets and the use of the Internet for business. As companies expand their electronic commerce, the need to protect corporate information assets becomes critical.

However, crafting a security system is no easy task. Security is complex because it cuts across so many aspects of an information system.

Security can be applied at the data link, network and application layers. It encompasses the mechanisms to control access to servers and other information systems as well as the devices that make up the network infrastructure. It also involves safeguarding information carried across a network.

The mechanisms used to provide security at the different layers can overlap or, in the worst case, conflict. For example, many desktop and network operating systems have built-in access control lists, and so do network devices such as remote access servers. There should be a common method for administering these lists.

Weaving disparate security pieces into an integrated system is a challenge—so is providing interoperability between different implementations of security mechanisms, such as encryption and authentication.

Despite its leadership in the firewall market, Check Point is too small a company to attempt to create an integrated security solution on its own.

Through the OPSEC framework and its alliance partners, however, Check Point has defined a platform that multiple vendors' products can plug in to. The approach offers flexibility, and the number of companies that have committed to some level of OPSEC support by joining the alliance speaks for itself.

Cisco, on the other hand, is building an integrated security offering based largely on its own products, with some technology contributed by alliance members. For organizations that have a lot of Cisco gear, this security effort will provide positive benefits. But it's unlikely to deliver the plug-and-play capability to which the OPSEC alliance is committed.

Security, like other areas of internetworking, is evolving rapidly. As you weigh your security options, be sure to balance integration against characteristics such as openness and extensibility to avoid having your security solution dictate your internetworking direction.

Petrosky is a senior analyst at The Burton Group, an information services firm that provides in-depth technology analysis. She can be reached at her San Mateo, Calif., office at (415) 572-0560 or via the Internet at petrosky@tbg.com.



soft Corp. There are many vendors selling products that read and write Microsoft formats at a fraction of the cost of Microsoft products. Older versions of Excel and Word are immune and still work quite well.

Telephones

The problem is not with E-mail. It is with Microsoft's gaping security holes and managers' zeal to upgrade needlessly.

Charles Evans
Fairfax, Va.



Phil Frank and Joe Troise baba@siggate.com

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Video Face-off



Lucent's PBX-like multipoint videoconferencing unit beats out MultiLink, PictureTel and VTEL, but tests show work remains on the ease-of-use front.

By Christine Perey

If your company regularly holds videoconferences involving three or more sites, you've probably considered purchasing a multipoint conferencing server. To help guide your decision, we looked at products from four leading vendors — which together comprise about 98% of the market — and one clear winner emerged: Lucent Technologies, Inc.'s MultiPoint Conferencing Unit (MCU). It outperformed the others in all categories.

A multipoint conferencing server is an integrated hardware/software network device that permits three or more remote sites to see and hear one another without perceptible delay. Today, all multipoint conferencing servers comply with the International Telecommunication Union's H.320 protocol to connect many vendors' products across circuit-switched networks, such as leased lines and ISDN. In time, these servers will perform similar functions for videoconferencing clients on packet-based LANs.

In a multipoint videoconference, people convey a wealth of contextual, nonverbal information to one another. However, if you think multipoint conferencing is like a visit to a "Star Trek" holodeck, think again. Currently, the feature set is basic, quality and reliability vary, and manageability ranges from downright awkward to "emerging."

The best MCU we tested, Lucent's MCU Release 4.1, derives its processor, memory, backplane, cabinets and software platform from Lucent's Definity Enterprise Communications Server (ECS), a PBX. In many respects it is more comparable to a PBX than to PC-based MCUs.

PBXs have proven themselves invaluable for voice

communications, primarily because of their reliability and scalability. Lucent's MCU earned our Blue Ribbon for providing the best features for network managers, conference operators and end users. Nevertheless, we think there's room for improvement in the continuous presence implementation we saw, in its ease of network configuration and integration of data conferencing support.

PictureTel Corp.'s Montage bridge is a well-established, full-featured product, but it's relatively difficult to use. PictureTel, like many other vendors, uses a VideoServer, Inc. Series 2000 Multimedia Conference Server as a base. PictureTel adds support for its proprietary PT724 and SG4 coder/decoders and bundles in LiveScheduler, PictureTel's conference reservation software. We decided PictureTel's Montage, for our purposes, was the best of the VideoServer OEMs to review because of the high-quality enhancements it offers over the base platform.

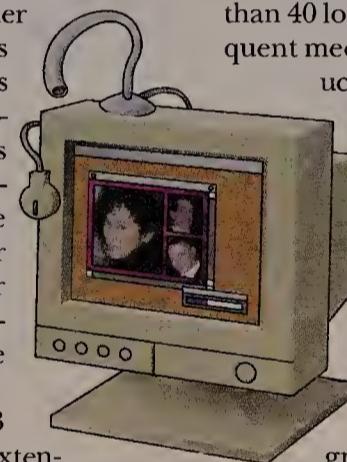
MultiLink, Inc.'s System 80 Version 1.3 is a new product from a company with extensive experience in the audioconferencing bridge market. The product's engineers focused on making it easier for users to get in and out of meetings with features that make it a strong contender — especially now that PictureTel has offered to buy the company (see story, page 42).

According to MultiLink, its System 70 dominates the audioconferencing service market with more than 70% of the long-distance, noncaptive service bureaus. Its mixed media conferencing counterpart, System 80, uses a similar architecture. It is based on banks of general-purpose digital signal processors (DSP), which can perform many functions, depending on the need of an individual conference or the needs of individual end points in a conference.

VTEL Corp. is second in market share to PictureTel in the room and group videoconferencing system market, according to Forward Concepts' Teleconferencing Markets and Strategies report. VTEL has offered the PC-based MCU-II since March 1994. Designed for corporate networks, the MCU-II, now in Version 1.12, has a maximum capacity of 20 ports and lacks some features we consider basic, such as a choice of conference setup modes, continuous presence and an integrated reservation package (for definitions of videoconferencing terms, see glossary, page 44).

We focused on MCUs designed for organizations with 100 or more video-enabled H.320-compliant end points. The H.320 protocol guarantees interoperability among videoconferencing end points and third-party network components such as multipoint conferencing servers. This is the enterprise-level end of the videoconferencing market; small workgroup systems are just emerging, most of them derivatives of the larger systems.

If you're deploying videoconferencing in more than 40 locations and intend to hold periodic or frequent meetings with multiple locations, these products will suit you well. Organizations with fewer than 30 or 40 systems may want to take advantage of offerings from videoconferencing service bureaus. (How do you decide which is best for you? We discuss the criteria to consider in a related story on Network World Fusion.)



Net configuration, capacity, scalability

We started our face-off by assessing the complexities associated with integrating an MCU into a new or existing network environment and making it operational. We also compared how each system would grow in port capacity and expand in functionality as enterprise needs expand.

Most bridges support ISDN Primary Rate Interface lines. PictureTel's offering on the VideoServer platform was the only one that offered a Basic Rate Interface connectivity option in addition to the PRI network interface and inverse multiplexer. This is an advantage only in small configurations of eight or so ports. VTEL requires external devices to connect to any network, making its product the least desirable from a systems integration standpoint.

All of the products offer the basic conferencing standards — H.261 for video; G.711, G.722 and G.728 for audio; and T.120 for data conferencing — but Lucent's MCU excelled with support for a number of proprietary video compression algorithms. In addition to the standards, PictureTel's Montage has support for PT724, a proprietary audio encoding algorithm, and SG4, the proprietary video encoding algorithm found in PictureTel videoconferencing group and desktop systems.

All of the vendors offer Windows-based conference management applications. Lucent's Conference Reservation and Control System's OpCenter appli-

BUYER'S GUIDE LINEUP

Scorecard: [Page 42](#).

Glossary: [Page 44](#).

Desktop video comes of age: [Page 44](#).

Complete product chart: [Page 46](#).

SCORECARD AT A GLANCE

Lucent Technologies, Inc. Multipoint Conferencing Unit	8.0
PictureTel Corp. Montage	7.4
MultiLink, Inc. System 80	6.7
VTEL Corp. MCU-II	5.5

cation is easiest to use by virtue of its tabbed interface to multiple nested screens and well-designed, logical screen layouts. MultiLink's systems management software uses drag and drop well, but the screen tends to get cluttered with multiple open windows.

We were especially pleased to find that multiple management workstations can connect to a server in the MultiLink, PictureTel and Lucent products. This permits a facility with multiple reservation and management terminals to manage a single bridge without having to move around reservationists.

We found MultiLink's hardware design, which uses eight general-purpose DSPs per board, makes System 80 highly flexible. We could use all available DSPs for 384K bit/sec audio/video processing in one call and use the same resources for audio only in the next call. By comparison, Lucent's MCU and PictureTel's Montage resources are not convertible on demand, which means video processing hardware cannot support an audio-only participant.

The products vary in scalability. For example, if your port requirements consistently exceed the total

capacity of a single Lucent chassis — more than 64 ports at 128K bit/sec — you can stack up to four chassis. The VTEL MCU-II does not accommodate expansion beyond 20 ports.

On the software side, MultiLink, PictureTel and Lucent management software is too complex for the casual user to pick up without specialized training. Because VTEL's system is more limited, management is simpler and the software is easier to use.

Administrative features, functions

After installation, a bridge should theoretically be available for scheduled and ad hoc conferences. In practice, because most MCUs are difficult to operate, ad hoc meetings are significantly less frequent than scheduled ones. Today's MCUs require some measure of administration prior to, during and after a meeting.

Lucent and PictureTel have a well-integrated software package for advanced resource scheduling. We believe that such a package should be provided with all products. Lucent's ResCenter and PictureTel's LiveScheduler tools are easy to use and powerful. For example, they track all conference room reservations, whether or not video is going to be used. That's a good idea — just because there's no videoconference scheduled doesn't mean the conference room isn't being used.

Additionally, ResCenter and LiveScheduler notify participants of a scheduled conference via fax or E-mail. Both provide tight integration with the vendor's directory services and call management tools. LiveScheduler also integrates the reservation process with other tasks, such as call accounting and report-generation tools.

A subset of Lucent's ResCenter, called Web.Res.Now, lets end users employ a Web browser to check on MCU availability and place electronic resource requests.

The four products differ significantly with respect to the ease of call setup. The process becomes particularly complicated when you consider that users may be calling in to a bridge — via single-number dialing or through unique ports assigned to each user — or the bridge may be calling the users. Additionally,

Go online for:

- Our analysis of the future direction of the MCU marketplace
- A detailed look at the pricing of each system, including an estimate based on our hypothetical configuration
- Other vendors in this market segment that did not participate in the evaluation, as well as a list of VideoServer OEMs
- Forward Concepts' Teleconferencing Markets and Strategies report



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there will be different mixes of video/audio terminals and audio-only participants.

VTEL MCU-II's call setup options are limited. For example, it lacks support for single-number dialing, but when a conference needs to begin, it can be initiated without delay. In contrast, the PictureTel MCU offers options such as having the bridge dial out to designated end points at a specified time, having participants dial in to a single number for a conference, or a mixture of these. However, many of these modes are not easily accessible; you have to spend too much time closing windows and moving through multiple screens of cryptic options. MultiLink's interface is also fairly complicated, but the use of drag-and-drop operations for placing end points in a conference is intuitive and reliable. Lucent's OpCenter software supports almost as wide a set of options as PictureTel's Montage but does so in a clear, no-nonsense way.

During a call, administrators should have tools to isolate and correct problems with the end points or MCU. In addition, administrators may be called on to modify settings during a conference. With the exception of VTEL's bridge, which lacked the flexibility of other products in terms of unique greeting capabilities or a continuous presence option, the products we evaluated provide strong call management tools. However, the PictureTel application seemed to have a number of unnecessary steps or screens.

Lucent's Universal Conference Control (UCC) software provides users with a touch-tone telephone that can dial in to the MCU and switch from presentation mode to continuous presence mode at the conclusion of a speaker's delivery, view all end points and perform other common tasks.

Lucent's UCC Point and Click is a graphical user interface for the same conference control capabilities, giving a call participant the ability to manage conference views through a separate modem connection to the MCU.

Keeping track of users' identities and preferences, site configurations and company requirements is an important part of an administrator's responsibility. The products we reviewed all provide directories, which give a reservation agent or call manager easy access to information about room, desktop and roll-about systems, including model numbers and most frequent users. However, all still have a way to go before directory services are smooth and intuitive.

In general, we preferred the approach used by Lucent and PictureTel. Their software associates an individual user with a location and lets administrators enter conference profiles, specifying preferred data rates, additional equipment and settings, even the people with whom a user collaborates most often.

After a conference, each system retains some data about the end points involved, duration of the meeting and the call modes utilized. These are important for resource planning and billing. We were

A fast-moving marketplace

On April 15, PictureTel Corp. announced its intent to acquire MultiLink, Inc. Though the transaction is not final, the companies say they intend to preserve the separate Montage product lines, using System 80 technology for PictureTel's future H.323 multipoint conferencing unit platform. Although product strategy was not included in the scope of this review, it seems plausible that over time, System 80 and Montage products will consolidate.

Similarly, on April 30, VTEL Corp. announced to its sales force that it will resell VideoServer MCS technologies under a license agreement. The VTEL SmartLink will, in most respects, be analogous to the PictureTel Montage featured in this review. ■

ScoreCard

Overall score

Network systems issues (20%)

Administrative features (25%)

Meeting participant features (30%)

Reliability, availability and serviceability (25%)



Multipoint Conferencing Unit

8

8

8

8

8

Montage

7.4

8

7

7

8

System 80

6.7

8

6

6

6

MCU-II

5.5

6

4

4

6

Scores based on a scale of 1-10. Percentages are the weight given each category in determining overall score.

Lucent Technologies, Inc.
MULTIPOINT CONFERENCING UNIT

Price as tested

\$156,830

PictureTel Corp.
MONTAGE

\$221,295

MultiLink, Inc.
SYSTEM 80

\$147,500

VTEL Corp.
MCU-II

\$206,690

Pros

- ▲ Ease of use of the conference reservation and control system
- ▲ PBX-like design
- ▲ Access to multiple carrier services from single bridge

- ▲ Continuous presence
- ▲ Strong scheduling tool
- ▲ Broad range of network interfaces, including BRI

- ▲ Flexible, on-the-fly resource allocation
- ▲ Drag-and-drop operator interface
- ▲ Subconferencing
- ▲ Flexible meet and greet

- ▲ Easy to use
- ▲ Good call report generation

Cons

- ▼ At the time of review, continuous presence delivered less than acceptable image clarity
- ▼ Basic Rate Interface network interface not offered

- ▼ Suboptimal operator tools for call/session monitoring and overall bridge management
- ▼ Suboptimal network access management tools
- ▼ Relatively expensive

- ▼ No continuous presence
- ▼ Lack of appropriate reservation software
- ▼ No BRI support

- ▼ No continuous presence
- ▼ Lack of suitable reservation software
- ▼ No T.120 option

impressed with the report-generating capabilities of the three leaders, but each could stand improvements to automate the process and simplify usage analysis. For example, the management report could be broken out automatically by cost center or department, and the vendors could improve the ability to export data to any report-generation tool.

All four products use password security for admitting those with the authority to change resource reservations or manage a call. Lucent has a concept of partitioning the MCU resources among different reservationists and giving the resources several levels of security. In general, though, the issue of security has not been paramount because these products were primarily used in service bureaus, where access to workstations is limited.

Meeting participant features

An MCU may be easy to integrate and manage from an administrative point of view, but if those who are dialing in to a

meeting are dissatisfied with the experience, the product is still a failure. While these products provide a high-quality and relatively flexible meeting environment, there is room for improvement.

Take in-conference user feedback and messaging, for example. H.243 is the standard that guides the implementation of messaging and conference control in H.320 end points. While bridges with full implementations of H.243 have the ability to provide users with feedback, developers of end-point hardware have failed miserably to implement and support the specification in their equipment.

Therefore, many potentially useful feedback and control options — such as letting users know they are on camera, standardized director control and user security — are not available to today's desktop and room conferencing users. The lone exception is the PictureTel Concorde, which supports many, if not all, parts of the H.243 spec. Because the end points generally lack this capability, VideoServer/PictureTel and Lucent responded by providing users with entry and exit tones, adopted from the familiar tones in the audioconferencing world, to indicate their status within a meeting.

Likewise, security is untapped due to limitations in the end points. While password security is specified in H.243, most videoconferencing end-point system manufacturers have failed to implement it. And forget integrated encryption — no standard algorithm has even been defined. We found two alternative approaches to limiting a conference to known participants. In MultiLink's System 80, a conference operator or attendant can subconference with each caller prior to adding the person to a con-

ference. If the caller is known to the attendant or has some unique way of indicating his authorization to enter the meeting, this can be considered an effective security measure.

In Lucent's MCU, a UCC-enabled user — the conference host, for example — can

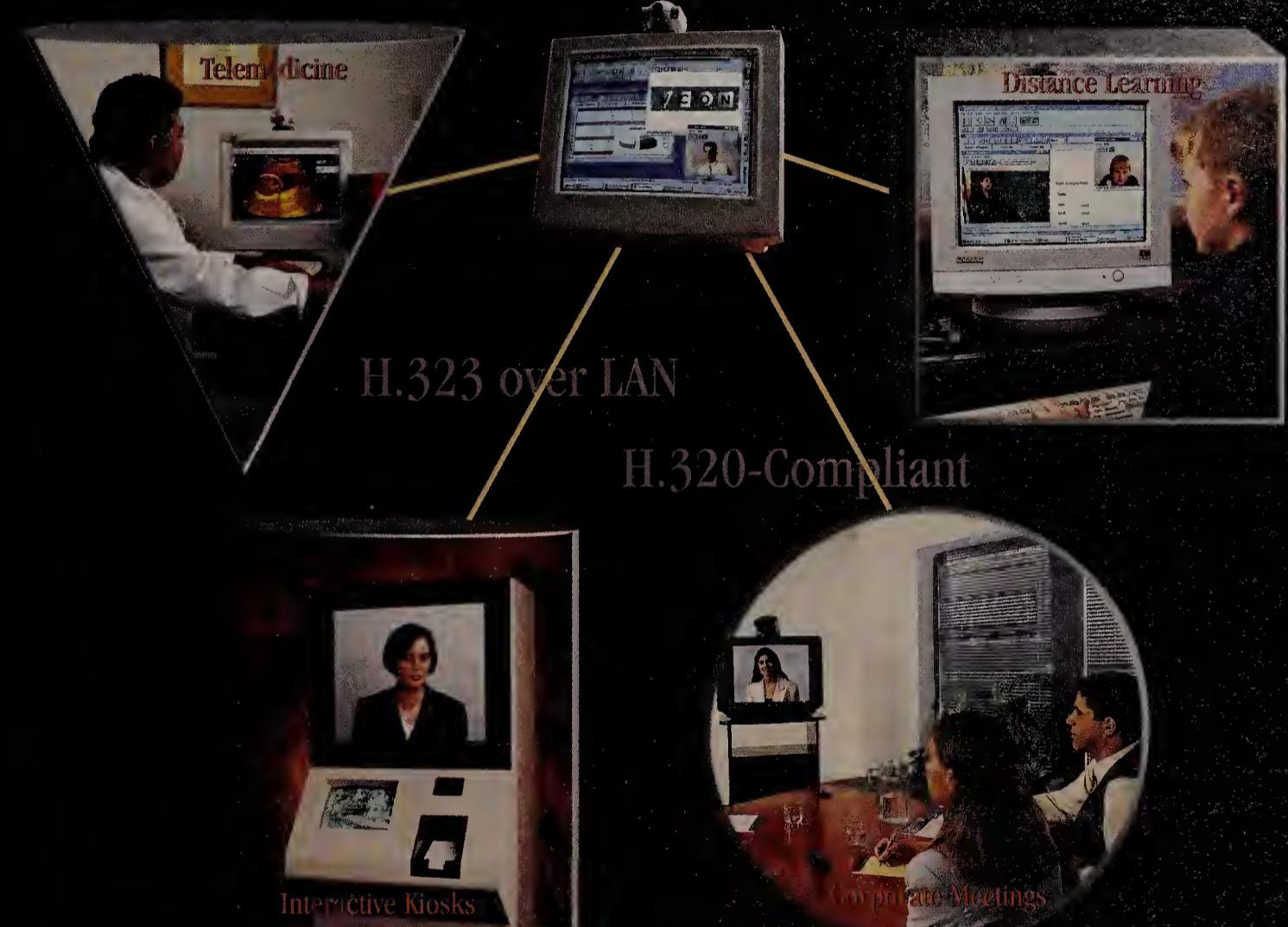
perform a complete sequential visual screening of all participants. Of course, this only works if the people's faces are recognized. The other two vendors offer more limited options.

These bridges let us perform director or "conference chair" control. But if users are

going to view virtual meetings as replacements for face-to-face meetings, there needs to be more. MultiLink's System 80 has a unique feature called subconferencing that lets people confer privately. To break into a subconference, the participant requests a private conference from the meeting

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VCON North American Headquarters:
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Dallas, Texas 75287-7308, USA
Tel: 972-735-9001 Fax: 972-735-9099
ISDN line: 972-857-8140/1

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VCON GmbH: Voltastrasse 6
63128 Dietzenbach, Germany
Tel: 49-6074-35882 Fax: 49-6074-35883
ISDN line: 49-6074-35945

administrator offline (via telephone) or from an attendant monitoring the meeting. The conference attendant creates a subconference and drops in selected participants until they ask to return to the main conference. Other participants are aware of the departure and return of those who subconference.

Continuous presence, or the ability to see four independent sources of video in one view, is an important feature — so important that in the near future, systems without continuous presence will fade away. VTEL's MCU-II lacks continuous presence entirely, while the quality of the images sent from Lucent's continuous presence module were substandard. However, a Lucent demonstration of an upgraded version, due this summer, showed resolution at 128K and 384K bit/sec that was on par with the high quality we saw from the PictureTel bridge.

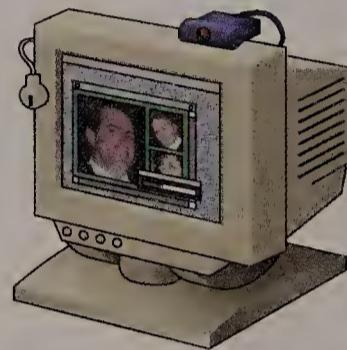
In addition to continuous presence, you should determine the cost of hardware or software required to support audio add-on participants — people using a telephone while others are using video and audio. We found that all the MCU manufacturers offer this, but it is standard in the base platform only in MultiLink's System 80. Similarly, while support for T.120 data and application sharing should be standard with MCUs, it remains an optional enhancement. We were told that until all end points are upgraded to support T.120 sessions, this will remain off the base platform configuration.

The quality of video and audio in a conference is as important to the user's satisfaction as the development of conference-control options. Most of the conference quality is a function of the video and audio codecs used on the end points, but MCUs have the potential to adjust the quality. For example, they can modulate audio levels when one source is too soft or too loud, or clean up videotreams before sending them to other end points. Our testing didn't reveal any major differences in conference quality related to these vendors' MCUs.

Reliability, availability, serviceability

Even in the best of systems, things go wrong. We considered the steps each manufacturer has taken to ensure that should systems fail, operations will continue uninterrupted, diagnosis will be rapid and accurate, and maintenance or repair will be prompt.

The scores we gave MCUs are based on design specifications, diagnostic tools, availability of replacement parts and support, software upgrade strategies and



Glossary

- **Chair control video switching:** A video-switching method in which a participant at a conference site selects who will be the current broadcaster from the controls provided by the conferencing system. The conference must be using voice-activated video switching, and the H.243 Chair Control option must be installed at the site. Contrast with user-selected video switching.
- **Continuous presence:** Describes an optional conference view where participants view other sites in one of four windows displayed simultaneously — think "Hollywood Squares." Some systems permit video switching among the participants when conferences exceed five video sources.
- **Director, chair or conference producer:** The person who controls the video switching and other activities for all participating sites.
- **Director-selected video switching:** A video-switching method in which the conference director selects the video source visible to all participating sites.
- **End point:** A PC or proprietary platform with network interfaces, cameras, microphones, speakers and display capabilities that enable videoconferencing.
- **Lecturer, presentation or instructional mode:** A choice for a site participating in a continuous presence conference in which one site is defined as the broadcaster to all other sites. The speaker or broadcaster is the only participant who sees a mix of other sites. All others view the speaker in maximum window size.

■ **Roll call:** The ability of a conference director to cause the conference server to switch to each participant in order to introduce them or to screen the conference for security purposes.

■ **Subconferencing:** A multipoint conference mode in which a conference operator has the ability to transfer participants into and out of separate, confidential conferences associated with a meeting, without having participants disconnect and reconnect again.

■ **Single-number dialing:** A conference setup feature in which participants who always meet on the same bridge always dial the same number for a predetermined meeting configuration. This dialing option does not dictate whether the meeting includes a conference operator or attendant and is distinct from single-number conference.

■ **Single-number conference:** A conference to which all participants dial in with the same number to connect, regardless of their location, and are placed directly into a conference. The conference server exchanges information with the terminal and assigns a free port in the conference on a first-come, first-serve basis until all the ports in the conference or in the MCU are taken.

■ **User-selected video switching:** A video-switching method in which a conference site chooses itself as the current broadcaster. The multipoint conference server must be set to voice-activated video switching. Contrast with director-selected video switching.

platform maturity. We researched this with all the vendors, and based on their responses, Lucent's MCU should provide the highest reliability because it is built on PBX technology. Though it should improve over time, the PC platform on which MultiLink's and PictureTel's products are based is just not as robust as a telecommunications system. All the products we examined provide customers with extensive status monitoring tools, and vendors train the conference producers to take extra measures to assure that every user's conference goes uninterrupted.

Products on course

We believe that as a group the PictureTel, Lucent and MultiLink products are solid, worthwhile investments for companies with many videoconferencing needs. If you have a policy or preference for getting all products and services from a single source, then the PictureTel and Lucent products will work for you. If you have a Lucent Definity PBX, Lucent's MCU goes to the head of the list because the company offers attrac-

tive discounts and makes integration into the network easier. Similarly, companies that already use a MultiLink audioconferencing bridge should consider the System 80 because the user interface for conference setup and MCU monitoring will be familiar. For private, leased-line networks of VTEL end points, the VTEL MCU-II still offers some value, although VTEL does not appear to have sustained the development of the other vendors whose products we examined. In other words, go with VTEL's MCU-II only if your entire network is dominated by VTEL room systems.

Perey is principal of Placerville, Calif.-based Perey Communications & Consulting, a multimedia communications research firm. She can be reached at cperey@spider.lloyd.com.

The author wishes to acknowledge the generous assistance of some vendor representatives who helped with this review — Jim Idelson at DesigNET International, Tonya James at 1-800-Video-on and Hadi Aboukhater at LinkVTC/ConferTech.

Desktop video is coming of age

By Kathy Scott

If you still think conducting a videoconference from your PC is pie in the sky, put such notions to rest.

Perhaps the most telling thing about the Buyer's Guide product chart starting on page 46 is the sheer number of vendors and products listed, especially for desktop-based videoconferencing systems. In total, there are 35 vendors and 59 products, roughly two-thirds of which are desktop systems.

Since 1995, the market has been flooded with desktop offerings. Vendors have capitalized on new standards and improvements in audio and video coder/decoder technology, as well as PC performance. The upshot is you've got lots of good options for real-time audio and video collaboration tools.

The days when you needed a high-speed leased line to support a videoconference are also gone. Almost all the vendors listed on our chart have embraced the H.320 suite of standards for video-

conferencing over switched digital lines. H.320 also includes standards for codecs. The only vendors using proprietary codecs — which the vendors claim offer superior quality and/or features — are Casio PhoneMate, Inc., CineCom Corp., Intelect Visual Communications Corp., Nogatech, Inc., Specom Technologies Corp., VocalTec, Ltd. and White Pine Software, Inc.

Product segmentation on the low end of the videoconferencing market is changing. Andrew Davis, a research associate at Forward Concepts, a consultancy in Tempe, Ariz., says that two years ago, roll-about systems sold for between \$15,000 and \$23,000. Now the lines of distinction among prod-





uct categories are beginning to blur with the introduction of compact, portable group systems. Vendors such as C-Phone Corp., Intel Corp., PictureTel Corp., Sony Electronics, Inc. and Zydacron, Inc. have all introduced these systems at prices ranging from \$7,000 to \$11,000.

Similarly, the chart lists products from Casio, Compression Labs, Inc., Data-point Corp., Intel, NEC America, Inc., PictureTel, TechnoVision Communications, Inc., VistaCom, Inc. and VTEL Corp. that can be customized for room, roll-about and desktop needs.

While that makes product comparisons tougher, the good news is the cost for a desktop system that includes a PC, monitor, soundboard, camera and keyboard continues to drop. And, by midyear, Davis says, many vendors will bundle videoconferencing systems with other related products. For example, Microsoft Corp. will bundle its NetMeeting conferencing software with its Internet Explorer 4.0 Web browser. The company also plans to make NetMeeting a core component in future versions of its Windows operating system.

"This will be a de facto standard for

basic desktop videoconferencing," says Steve Lichtman, director of the collaborative work environments lab of the American Management Systems, Inc.'s (AMS) Center for Advanced Technologies, an IT consulting firm in Fairfax, Va.

But don't expect implementing these systems to be a cakewalk. Take ISDN, for example. It has helped solve the bandwidth problem, but local carriers offer notoriously poor support for the technology.

"I have not talked to anyone who got their videoconferencing system to work the first time [with ISDN]," Lichtman says. ISDN calls are also expensive, he adds, pointing out that it costs AMS between 50 cents and 60 cents a minute for calls from Fairfax to California.

ISDN-to-LAN gateways such as Intelect Visual's VuBridge and PictureTel's LiveGateway — PC server add-ons that provide bidirectional interoperability among LANs and ISDN lines — could help defray some of the costs, however. They eliminate the expense of connecting the PC directly to an ISDN line. According to Peter Mahoney, director of product marketing for the personal sys-

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- Product charts for multi-point conferencing units and our take on MCU trends.

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tems division at PictureTel, 1997 will see many users deploying LAN-based videoconferencing, some in a fairly wide manner. At that point, things could get interesting. "People don't know what will happen when you put 5,000 videoconferencing clients on a network," Mahoney says.

Given these myriad options, PictureTel and other vendors will also deliver multi-point bridge and gateway products to promote interoperability among the various types of systems.

These products will let users working

on the LAN communicate with users in small offices and telecommuters using ISDN. In addition, Mahoney says, look for more action in the areas of virtual private networks over the Internet and intranets.

Amid all the product developments, a question still lingers: Do we really need this stuff? Davis says that no single compelling business application for the corporate office has thus far surfaced for videoconferencing, although the technology is making big inroads in telemedicine, distance learning and selected financial services.

"The application that is most likely to be a killer app in the future is help desk," he says.

Desktop leaders PictureTel and Intel naturally disagree. They contend visual communication is the way to go for all kinds of applications, such as project team interaction, project reviews, advanced customer support, interviewing, recruiting, document-centered conferences and general business meetings. Lichtman's organization, AMS, even uses videoconferencing to help its developers apply reusable software on client projects. ■

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BUYER'S GUIDE

VIDEOCONFERENCING ENDPOINT PRODUCTS

Company	Product	Type	Operating system	PC minimum configuration	Network support	Window size (pixels): Bandwidth (bit/sec): Max. frame rate (fps)	Features	Echo cancellation	Price
ACT Videoconferencing, Inc. (303) 202-2964 www.acttel.com	Action View Classic	Roll-about	Windows 95	RAM: 8M Disk: 10M	LAN H.320 (128K ISDN) H.320 (384K ISDN) H.324 dial-up Proprietary dial-up Switched digital Fractional T-1 T-1 ATM Frame relay IP/WAN	352x288: 128K: 15 352x288: 384K: 30	Application sharing Far-end camera control File transfer Document sharing Multipoint conferences Shared whiteboard User refresh rate control	Supported in hardware	\$9,995-\$19,995
	Action View Desktop	H.320-based videophone	NA	RAM: NA Disk: NA		352x288: 128K: 15 352x288: 384K: 30			\$4,959-\$7,647
	Action View Elite	Room, roll-about	Windows 95	RAM: 8M Disk: 10M		352x288: 128K: 15 352x288: 384K: 30			\$28,220-\$42,000
	Action View PC	PC add-on hardware/software	Windows 95	RAM: 8M Disk: 10M		352x288: 128K: 15 352x288: 384K: 30			\$2,845-\$8,237
	Action View Ultima	Room	Windows 95	RAM: NA Disk: NA		352x288: 128K: 15 352x288: 384K: 30			\$33,250-\$55,000
	Desktop Video-conferencing System	Roll-about, PC with hardware/software	NetWare, Windows 3.X, NT, 95	RAM: 8M Disk: 240M		640x480: dedicated video LAN: 30			\$2,495-\$109,310
C-Phone Corp. (910) 395-6100 www.cphone.com	LT-70P 9.5	Room, roll-about, set top device	Proprietary	RAM: NA Disk: NA		640x480: 14.4K: 1-3 (1)			\$1,899-\$3,500
Casio PhoneMate, Inc. (310) 618-9910 www.casiophonemate.com	CineVideo Family	PC add-on software	Windows 3.X, NT, 95	RAM: 8M Disk: 2M		160x120: 28.8K: 15 160x120: 128K: 15			\$49.95-\$299.95
Compaq Computer Corp. (800) 345-1518 www.compaq.com	Deskpro Series 2000 and 4000	PC with hardware/software	Windows 3.X, 95	RAM: 16M Disk: 1.08G		352x288: 1M: 7 352x288: 128K: 7 176x144: 1M: 12 176x144: 128K: 12 160x120: 128K: 15			\$2,875-\$3,960
Compression Labs, Inc. (800) 538-7542 www.clx.com	Lunar	Roll-about, PC with hardware/software	Windows 95	RAM: 16M Disk: 112M		352x288: 384K: 15 176x144: 128K: 15			\$3,950-\$18,950
Connectix Corp. (800) 950-5880 www.connectix.com	VideoPhone 2.0	PC add-on hardware/software	MacOS, Windows 3.X, 95	RAM: 16M Disk: 10M		352x288: 1M: 12 352x288: 128K: 4 176x144: 128K: 7 160x120: 28.8K: 2			\$60-\$250
Corel Corp. (613) 728 8200 www.corel.com	CorelVideo Enterprise 1.71	PC add-on hardware/software	MacOS, Windows 3.X, NT, 95	RAM: 8M Disk: 10M		Analog NTSC solution: 30			\$1,500+ per seat
	CorelVideo Remote 1.1	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 10M		RI: 128K: 17 RI: 384K: 24			\$1,995-\$4,395
Creative Software Technologies Pty, Ltd. 61-3-9563-4110 www.cst.com.au	CamWiz Works 2.5	PC add-on hardware/software	Windows 3.X, 95	RAM: 8M Disk: 10M		160x120: 28.8K: 1 160x120: 128K: 4			\$519-\$576 (2)
Datapoint Corp. (800) 378-6469 www.datapoint.com	NVS100	Stand-alone interface for PCs, TVs and monitors	MacOS, OS/2, Unix, Windows 3.X, NT, 95, SUN O/S, Solaris	RAM: 4M Disk: 10M		640x480: dedicated video LAN: 30			\$2,220-\$4,415
	NVS400	Roll-about, PC with hardware/software	Windows NT, 95	RAM: 16M Disk: 20M		352x288: 128K: 30 352x288: 384K: 30			\$12,950-\$25,000
	PCNVS	PC add-on hardware/software	OS/2, Windows 3.X, NT, 95	RAM: 4M Disk: 10M		640x480: dedicated video LAN: 30			\$1,749-\$2,770
Diamond Multimedia Systems, Inc. (800) 727-8772 www.diamondmm.com	Supra Video Phone Kit 3000	PC add-on hardware/software	Windows 95	RAM: 8M Disk: 25M		176x144: 28.8K: 12			\$399
Elsa, Inc. (800) 272-3572 www.elsa.com	ElsaVision	PC add-on hardware	Windows 3.X, NT, 95	RAM: 16M Disk: 5M		352x288: 128K: 15 176x144: 128K: 30			\$1,499
IrTel Corp. (800) 533-3373 www.irtel.com	ProShare Video 200 Version 2.0a	PC add-on hardware/software	Windows 3.X, 95	RAM: 16M Disk: 45M		352x288: 1M: 7 352x288: 128K: 7 176x144: 1M: 12 176x144: 128K: 12 160x120: 128K: 15			\$1,499

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NetworkWorld

TECHNICAL SEMINARS

NEXT GENERATION MESSAGING

Capitalizing on Internet & Client/Server E-mail

Presented by Daniel Blum, Rapport Communication

16 BENEFITS OF ATTENDING!

1. Anticipate and profit from key Internet/Intranet next generation messaging trends
2. Leverage open POP3/IMAP4 and LDAP access protocols
3. Configure a robust SMTP/MIME infrastructure
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5. Harness the messaging infrastructure for web-based mail and collaborative applications
6. Plan directory integration using LDAP, X.500, and meta-directories
7. Practice "safe messaging" using PGP or S/MIME
8. Assess "do's and don'ts" message-based electronic commerce
9. Analyze vendor product positioning
10. Evaluate Internet service provider (ISP) messaging connectivity or management support for small, mid-sized, and large enterprises
11. Understand and take advantage of different product/service pricing structures
12. Follow best practices for messaging administration, help desk, and management
13. Use proven methodologies for planning strategy, migration, procurement, and deployment
14. Define performance measures and service level expectations to maximize end user satisfaction
15. Master the intricacies of interconnecting standards-based and legacy messaging systems through gateways
16. Time-saving tips and pointers to valuable messaging information resources

Enterprises across the world are eager to capitalize on Internet and client/server E-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support high-volume, mission-critical applications on your Intranet, Extranets, or the Internet at large.

Internet and client/server messaging systems are based on proven yet dynamically evolving standards. Thanks to the wide acceptance of the standards, intense user demand, and strong vendor leadership programs, Internet and client/server mail products are becoming more robust and flexible. Through the smart deployment of messaging products that add value in the areas of standards, security, directory, management, and applications integration, enterprises can build sustained competitive advantage in a cost-effective manner.

Next Generation Messaging will help you decide what services you need from client/server Internet messaging, and what benefits your company can expect from upgrading to the latest stan-

dards and technologies. You will learn how, when, and why to deploy products supporting new standards like Multi-purpose Internet Mail Extensions (MIME), Internet Message Access Protocol 4 (IMAP4), Extended Simple Mail Transfer Protocol (ESMTP), and the Lightweight Directory Access Protocol (LDAP).

This seminar, taught by Daniel Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

Next Generation Messaging will provide you with the information and insight necessary to more efficiently and effectively implement and manage your messaging infrastructure.

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- Free 3-month trial subscription to *Rapport Messaging Review*, the premier industry newsletter covering the business and technology of electronic messaging
- Luncheon and break refreshments
- All of the above included in your \$450 registration fee



DATES & LOCATIONS

5/29/97	New York, NY	6/11/97	Washington, DC
6/3/97	Irvine, CA	6/24/97	Chicago, IL
6/4/97	San Francisco, CA	6/25/97	Atlanta, GA
6/5/97	Seattle, WA	7/22/97	Philadelphia, PA
6/10/97	Boston, MA	7/23/97	Dallas, TX

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BUYER'S GUIDE

VIDEOCONFERENCING ENDPOINT PRODUCTS

Company	Product	Type	Operating system	PC minimum configuration	Network support	Window size (pixels): Bandwidth (bit/sec): Max. frame rate (fps)	Features	Echo cancellation	Price
Intel Corp. (cont.) (800) 538-3373 www.intel.com	ProShare TeamStation and TeamStation Pro	Room, PC with hardware/software	Windows 3.X, 95	RAM: NA Disk: NA	LAN H.320 (128K ISDN) H.320 (384K ISDN) H.324 dial-up Proprietary dial-up Switched digital Fractional T-1 T-1 ATM Frame relay IP WAN	176x144: 1M: 18 176x144: 128K: 10 160x120: 128K: 15	Application sharing Far-end camera control File transfer Document sharing Multipoint conferences Shared whiteboard User refresh rate control	Supported in hardware	\$11,999-\$17,999
Intelect Visual Communications Corp. (212) 317-9600 www.videoconferencing.com	LANscape 1.4	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 5M		Bandwidth/processor dependent		Free	\$2,995-\$5,095
Microsoft Corp. (800) 426-9400 www.microsoft.com/netmeeting	NetMeeting 2.0	PC add-on software	Windows NT, 95	RAM: 8M Disk: 5M		Bandwidth/processor dependent		Free	\$995-\$1,495
Multimedia Access Corp. (800) 250-6622 www.mmac.com	Osprey 1000 and 1100	PC add-on hardware	Solaris, Unix, Windows 3.X, NT, 95	RAM: 8M Disk: 2M		640x480: dedicated video LAN: 26 352x288: 128K: 15 352x288: 384K: 26			\$1,300-\$2,500
NEC America, Inc. (800) 832-6632 www.nec.com	TeachingPro 5000 and TeleDoc 5000	Room, roll-about	Windows 95	RAM: 8M Disk: 10M		176x144: 28.8K: 15			\$399-\$699
Nogatech, Inc. (408) 342-1406 www.nogatech.com	ConferenceCard 1.06	PC add-on hardware/software	Stand-alone hardware/software codec	RAM: 8M Disk: 4M		352x288: 128K: 15 352x288: 384K: 15			\$19,750-\$66,000 (3)
Northern Telecom, Inc. (800) 466-7835 www.nortel.com	Multimedia Conferencing 1.0	PC add-on hardware/software	Windows 95	RAM: 12M Disk: 30M		Bandwidth/processor dependent			\$329
Panasonic, Inc. (800) 528-8601 www.panasonic.com	VisionSeries 2.2	Roll-about	Windows 3.X, 95	RAM: NA Disk: NA		352x288: 128K: 15 352x288: 384K: 30 176x144: 128K: 30			\$1,995-\$2,795
PictureTel Corp. (800) 716-6000 www.picturitel.com	Concorde 4500 Version 6.11	Room, roll-about	Complete stand-alone system	RAM: NA Disk: NA		640x480: 1M:(4) 352x288: 128K:(4) 352x288: 384K:(4)			\$22,105-\$33,445
	LiveLAN 3.0	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 25M		352x288: 128K: 15 176x144: 128K: 15			\$1,495
	Live50 Version 1.6	PC add-on hardware/software	Windows 3.X, 95	RAM: 16M Disk: 20M		352x288: 128K: 15 352x288: 384K: 15 176x144: 128K: 15			\$2,495-\$3,495
	Live100 Version 1.6	PC add-on hardware/software	Windows 3.X, 95	RAM: 16M Disk: 20M		352x288: 128K: 15 352x288: 384K: 15 176x144: 128K: 15			\$4,995
	Live200 Version 1.1	PC add-on hardware	Windows 95	RAM: 16M Disk: 20M		352x288: 128K: 15 176x144: 128K: 15			\$1,495
	SwiftSite 1.0	Compact system	Complete stand-alone system	RAM: NA Disk: NA		352x288: 128K: 15			\$8,995
	Venue 2000 Version 1.2	Room, roll-about	Complete stand-alone system	RAM: NA Disk: NA		352x288: 128K: 15 352x288: 384K: 30			\$18,500-\$21,000
Sagem (408) 446-8690 www.satusa.com	Meet-Me H.320 Light	PC add-on software	Complete stand-alone system	RAM: 16M Disk: 8M		Bandwidth/processor dependent			\$295 per seat
	Meet Me H.320 for Nubus	PC add-on hardware/software	MacOS	RAM: 16M Disk: 5M		352x288: 128K: 15 176x144: 128K: 15			\$1,850-\$2,550
Smith Micro Software, Inc. (800) 964-7674 www.smithmicro.com	AudioVision 2.0	PC add-on software	MacOS Windows 3.X, NT, 95	RAM: 8M Disk: 1M		176x144: 28.8K: 12 160x120: 28.8K: 15 Bandwidth/processor dependent for IP			\$100 for 2 seats

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VIDEOCONFERENCING ENDPOINT PRODUCTS

Company	Product	Type	Operating system	PC minimum configuration	Network support	Window size (pixels): Bandwidth (bit/sec): Max. frame rate (fps)	Features	Echo cancellation	Price
Sony Electronics, Inc. (800) 686-7669 www.sel.sony.com/sel/bppg	TriniCom 3000 and 5000	Roll-about	Proprietary	RAM: NA Disk: NA	LAN H.320 (128K ISDN) H.320 (384K ISDN) H.324 dial-up Proprietary dial-up Switched digital	352x288: 128K: 15 352x288: 384K: 15	Application sharing Far-end camera control File transfer Document sharing Multipoint conferences Shared whiteboard User refresh rate control	Supported in hardware	\$9,975-\$27,500
	TriniCom 500	PC add-on hardware/software	Windows 3.X, 95	RAM: 16M Disk: 15M	T-1 ATM Frame relay IP WAN	352x288: 128K: 15 176x144: 128K: 15			\$1,995
Specom Technologies Corp. (408) 982-1880 www.specom.com	C.Visions 3.02 and VisionTime IVP 3.02	PC add-on software	Windows 3.X, 95	RAM: 8M Disk: 3M		8bandwidth/processor dependent			\$39-\$129
	SuiteVisions 3.0	PC add-on hardware/software	Windows 3.X, 95	RAM: 8M Disk: 3M		8bandwidth/processor dependent			\$179
TechnoVision Communications, Inc. (619) 231-0555 www.technovisioninc.com	TVCS 2.2	Room, roll-about, PC with hardware/software	Banyan VINES, NetWare, Windows 3.X, NT, 95	RAM: 8M Disk: 540M		352x288: 128K: 30 176x144: 1M: 30			\$3,775-\$24,350
U.S. Robotics (800) 342-5877 www.usr.com/bigpicture	Bigpicture Video Camera and Capture Card 1689	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 10M		176x144: 28.8K: 15			\$249.95
	Bigpicture Video Kit 1622	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 15M		176x144: 28.8K: 15			\$399.95
	Bigpicture Video Modem and Capture Card 1690	PC add-on hardware/software	Windows 95	RAM: 16M Disk: 15M		176x144: 28.8K: 15			\$249.95
VCON, Inc. (972) 735-9001 www.vcon.com	Armada Cruiser 150	PC add-on hardware/software	Windows 3.X, 95	RAM: 16M Disk: 15M		352x288: 384K: 15 176x144: 128K: 15 8bandwidth/processor dependent for IP			\$1,895-\$4,295
VideoLan Technologies, Inc. (800) 715-3315 www.videolan.com	VL2000 Desktop Video and Multimedia Network 3.0	PC add-on hardware/software	Windows 3.X, 95	RAM: 18M Disk: 5M		640x480: dedicated video LAN: 30 352x288: 128K: 15 352x288: 384K: 15			Net configuration dependent
VistaCom, Inc. (408) 253-5165 www.vistacom.fi	VCI 10 and 100	Roll-about, PC with hardware/software	Unix, Windows 3.X, NT, 95	RAM: 4M Disk: 3M		352x288: 1M: 30 352x288: 128K: 15 352x288: 384K: 15 176x144: 1M: 30 176x144: 128K: 15			\$1,995-\$4,720
VocalTec, Ltd. (201) 768-9400 www.vocaltec.com	Internet Phone 4.0	PC add-on software	Windows NT, 95	RAM: 16M Disk: 10M		8bandwidth/processor dependent			\$49.95
VTEL Corp. (800) 299-8835 www.vtel.com	Enterprise Series Leadership System LC5000	Room, roll-about, PC with hardware/software	Windows 95	RAM: 32M Disk: 1.2G		352x288: 128K: 15 352x288: 384K: 30 176x144: 1M: 30 176x144: 128K: 15			\$53,995-\$57,995
	Enterprise Series Team System TC1000 and 2000	Room, roll-about, PC with hardware/software	Windows 95	RAM: 16M Disk: 1.2G		352x288: 128K: 15 352x288: 384K: 30 176x144: 1M: 30 176x144: 128K: 15			\$21,495-\$46,996
	SmartStation 128 and 384 Series 3.0	PC with hardware/software	Windows 95	RAM: 16M Disk: 35M		352x288: 128K: 15 352x288: 384K: (5) 176x144: 128K: 30			\$1,995-\$7,985
White Pine Software, Inc. (800) 241-7463 www.wpine.com	Enhanced CU-SeeMe 2.11	PC add-on software	MacOS, Windows 3.X, NT, 95	RAM: 12M Disk: 10M		Bandwidth/processor dependent			\$69-\$99 per user
	VideumConf Pro	PC add-on hardware/software	Windows 3.X, NT, 95	RAM: 16M Disk: 5M		8bandwidth/processor dependent			\$199-\$399
Zydracron, Inc. (603) 647-1000 www.zydracron.com	OnWAN 2.0	PC add-on hardware/software	OS/2, Windows 3.X, NT, 95	RAM: 16M Disk: 6M		352x288: 128K: 15 352x288: 384K: 15 176x144: 128K: 15			\$3,495-\$4,990

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Management Strategies

Covering: Budgeting, Staffing and Career Planning

Briefs

The 1997 Information Management Conference will be held June 26-27 in Chicago.

At the conference, senior information managers can focus on World-Wide Web-based technologies, optimum information flow, strategies for better alignment of IT with corporate goals, options for improving IT flexibility and maximizing IT resources.

The complete conference costs \$975 for Conference Board Associates, and \$1,175 for nonassociates. Team discounts for three or more attendees are available.

© Conference Board: (212) 339-0343

Technology Training Group (TTG), an affiliate of Bedford, N.H., IT consulting and training firm New Technology Partners, recently opened a training facility in Woburn, Mass.

Courses for network developers, administrators and systems engineers on the following Microsoft Corp. technologies and applications are available: Windows 95, Windows NT, Access, Visual Basic, TCP/IP, Systems Management Server, SQL Server, Exchange Server and Internet Information Server.

In addition, the facility will be used as a download site for live and prerecorded Microsoft TV broadcasts.

© TTG: (888) 342-5884

Training software developer VFX Technologies, Inc. in Valley Forge, Pa., has two new assessment exams to help users prepare for Microsoft Corp. certification, including the Microsoft Certified Systems Engineer test.

The tools focus on testing requirements for the Microsoft 70-24 MFC/C and 70-68 NT Server & Enterprise exams.

They are available on a floppy disk or electronically and cost \$99.95.

© VFX: (610) 265-9222

How to get the most out of your hired guns

Contractors can be a useful tool in your kit if you take the proper precautions and encourage communication.

By Douglas Welch

You bring in a contractor to handle part of a critical network project that's gotten off track. The strategy works like a charm — you quickly get back on schedule. But just as suddenly, the contractor sees the grass looking greener in some other company's pasture.

He rushes to finish what you hired him to do and is off in a flash. The finished product still looks good, but there's virtually no trace of how the work was done or how it can be integrated with the rest of the project.

There are several ways to protect yourself from falling victim to this scenario.

For one thing, draft a detailed contract that not only spells out usual details, such as work hours, payment schedule and adherence to a professional code of behavior, but also specifies how the contractor will give you information about what was done. This might include written documentation, detailed procedures and even formal training for staffers.

The goal here is to ensure that your staff can fix whatever goes wrong once the contractor leaves and can build on the foundation left behind.

Furthermore, make sure at least one of your full-time staffers understands the contractor's duties and responsibilities. This doesn't mean peering over the contractor's shoulder. Rather, the staffer should meet regularly with the contractor and become the person who receives electronic or written documentation when the job is done.

Your employee should also be able to immediately step in and keep the work going if the contractor leaves ahead of schedule.

"We include our need for final documentation in the original contract," says Ellis Hillinger, network manager for Simpson Timber Co., a forestry products firm in Shelton, Wash. "We also work quite closely with the contractor during the course of a project and help that person shape the documentation so

it is satisfactory to everyone involved."

Hillinger is not alone. "I require status reports and documentation of all information on a project," says Paul Harker, president of Harker Enterprises, Inc., a network management and installation consultancy in Idaho Falls, Idaho.

"I also require all information to be passed in paper or electronic form. If something is implemented, require the contractor to write the operating/configuration procedure also. This documents all necessary information," Harker says.

Harker has had experience on both sides of the issue, first as a senior network engineer at Lockheed Martin Idaho Technologies Co. and now as a network design consultant.

The right stuff

It is also important to carefully choose what you let contractors take on. While closed-end projects such as hardware and software installations lend themselves well to contract labor, handing over day-to-day operations to an outsider might not be a good fit.

www.nwfusion.com

Go online to learn more about contract labor and outsourcing in general. Check out our Special Section on Outsourcing, published late last year, and get advice on devising service level agreements with your contractors.



are tasks that we typically contract out."

Defining the precise deliverables due at the end of a project makes it much easier to manage a contractor and evaluate performance.

Otherwise, you're forced to subjectively evaluate contractors much in the same way you do some permanent staff. This is troubling and time-consuming.

CONTRACT LABOR CHECKLIST

- Draft a detailed contract. Spell out work hours, payment schedule, code of behavior and details on how you'll be filled in on work performed.
- Make sure at least one full-time staffer understands the contractor's duties and responsibilities and meets with the contractor regularly.
- Use contractors primarily for closed-end projects that can be performed independently and are easy to monitor.
- Define the precise deliverables due at the end of a project.
- Be open to feedback and opinions from contractors; try to learn from them.

Likewise, assign contractors work that can be done independently but is also easy to monitor and manage.

For example, if your company is installing a new network operating system, let the contractor do the work. Once it is complete, the contractor can turn teacher and instruct your staff on how to install additional servers, new versions of the operating system and how best to use the technology.

Don't place contractors in highly specialized, mission-critical positions. Those types of positions should be reserved for in-house staffers who hopefully will have a bigger stake in the company and, therefore, stay longer.

Open your eyes

Not all problems reside on the contractor side of the relationship. Often, you can be so buried in your own crises that you abandon contractors to their own devices.

You may even resist receiving input or feedback from a contractor you've hired to carry out a specific task.

"The lead contractor I worked with is very sharp, profes-

sional and courteous," Hillinger says. "This made it difficult for him to call my attention to decisions he thought were bad."

A different view

Remember that contractors often bring a fresh perspective to a project. Be open to their opinions, and learn from them as much as you can. What began as a short-term relationship

might turn into a long-term, mutually beneficial, cooperative agreement.

As a contractor, Harker has found that educating his customers has been beneficial because it spawns repeat business.

"Customers know they can call me when [they need to tap my brain]," he says.

"Just today, I received a call thanking me for explaining network traffic issues and segmentation. The customer had just segmented his network and now wants me to design a network system for headquarters," Harker says.

Used correctly, contractors can be a useful tool. In fact, they rapidly are becoming a necessity because of the dearth of talent in hot technologies such as Windows NT. The trick is making sure your relationships with contractors are productive.

Taking a few precautions and developing guidelines that you and your contractors can live with is a step in the right direction.

Welch is a computer consultant and freelance writer in Van Nuys, Calif. He can be reached at dwelch@earthlink.net.

Software Consultant. Provide services to clients in design & development of business applications & systems to support Material Inventory Management using IBM AS/400 & OS/400; dev. modules to support receiving of materials, inspection of materials & warehouse inventory & replenishment activities, using Oracle, SQL*Forms, SQL*Plus, PL/SQL & Unix shell scripts; customize & enhance applications & migrate database info with PL/SQL, SQL*Menu, RPT, & JCL on HP-Unix & RISC-6000 in an MS-Windows environment; dev. Screens, testing procedures & build SQL*Plus reports; dev. shell scripts using AWK tools for manipulating data files & placement into barcode templates that print contract-level & shipping barcoded labels; prepare system flow diagrams in ABC FlowCharter; use Explain Plan for tuning & restructure of SQL; maintain mainframe/remote user LAN communications; dev. process to receive damaged items & to generate emergency damage reports; provide technical support as needed. \$49,754/yr. 40 hrs/wk. B.S. in Computer Sc. or Computer Eng., or Math & 2 yrs. exp. in job offered or 2 yrs. related as Sr. Systems Analyst, Systems Analyst or Programmer Analyst to include use of noted skills in job duties. B.S. may be foreign equivalent degree. Submit resume to the GA Dept. of Labor, Job Order #GA6096739, 1535 Atkinson Rd., Lawrenceville, GA 30243-5601 or the nearest Dept. of Labor Field Service Office.

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The Product Manager will be charged with P/L responsibility for a suite of high speed data services and development & execution of programs necessary to achieve business objectives. The ideal candidate will have a BS/BA (MBA preferred) and 5+ years experience in data communications (LAN/WAN, Cell/Frame Relay technologies, players and industry directions), financial planning fundamentals, classical business marketing experience, and a strong track record of achievement.

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EOE M/F/D/V

Software Engineer II. \$35,000-42,000 per year. Responsible for designing, coding, testing of telecommunications software in C/C++ or Fortran. Must be able to accomplish these tasks in the following environments: UNIX, Windows, Windows-NT, OO and VMS. Configures and utilizes PC's and associated software tools. Responsible for sub-system and completion of tasks from inception to delivery. Requires Bachelor's Degree in Computer Science or Electrical Engineering, plus one year experience. Send Resumes to: Ms. Connie Wood, MTEL, 200 South Lamar, 7th Floor, South Building, Jackson, MS 39201.

NETWORK ENGINEERS - DFW

- 2 or more years experience designing high speed multi-protocol networks or network management systems
- BS in Electrical Engineering or Information Systems required
- 3 or more of the following disciplines are required:
- Multiple Communication Protocols and Standards (X.25, PPP, TCP/IP, IPX/SPX, IGRP, EIGRP, RIP)
- Local Area Network Design (LAN Switching, Novell OS, Token Ring, Ethernet)
- Wide Area Network Design and Architecture (X.25, FrameRelay, ATM, SONET)
- Internetworking Design Standards (TCP/IP, IPX, PPP, IP Addressing, IP Filtering)
- Cisco Router Network Configuration and Design (HighSpeed LAN/ATM Switches, HighSpeed Routers)
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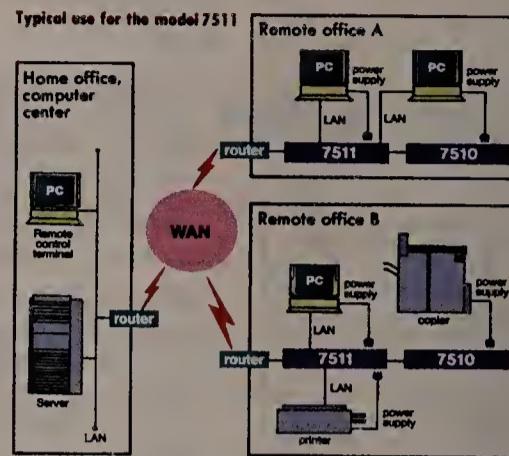
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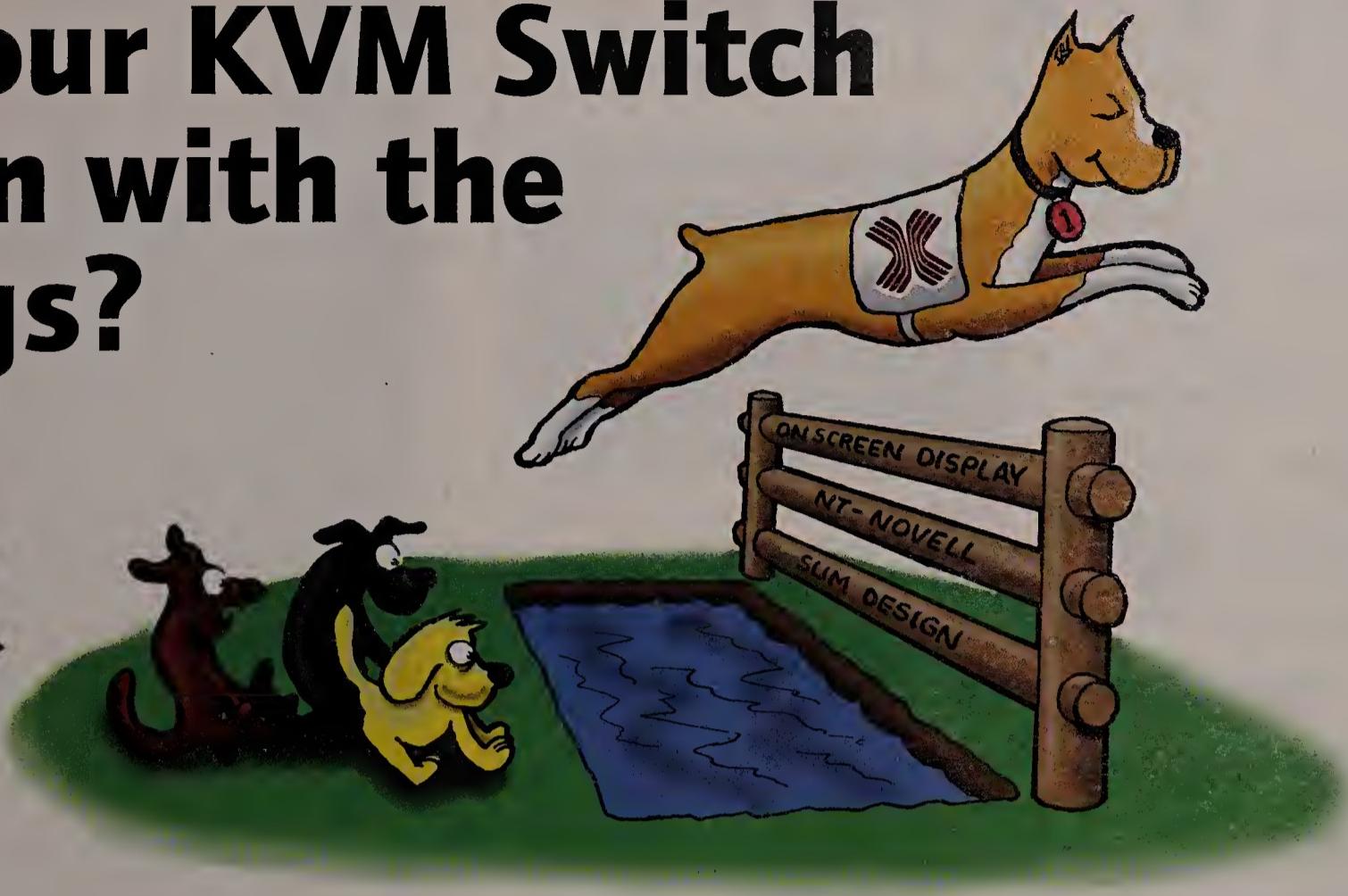
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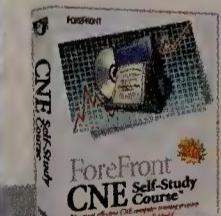
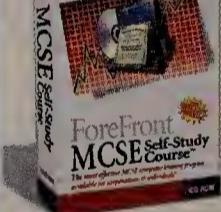
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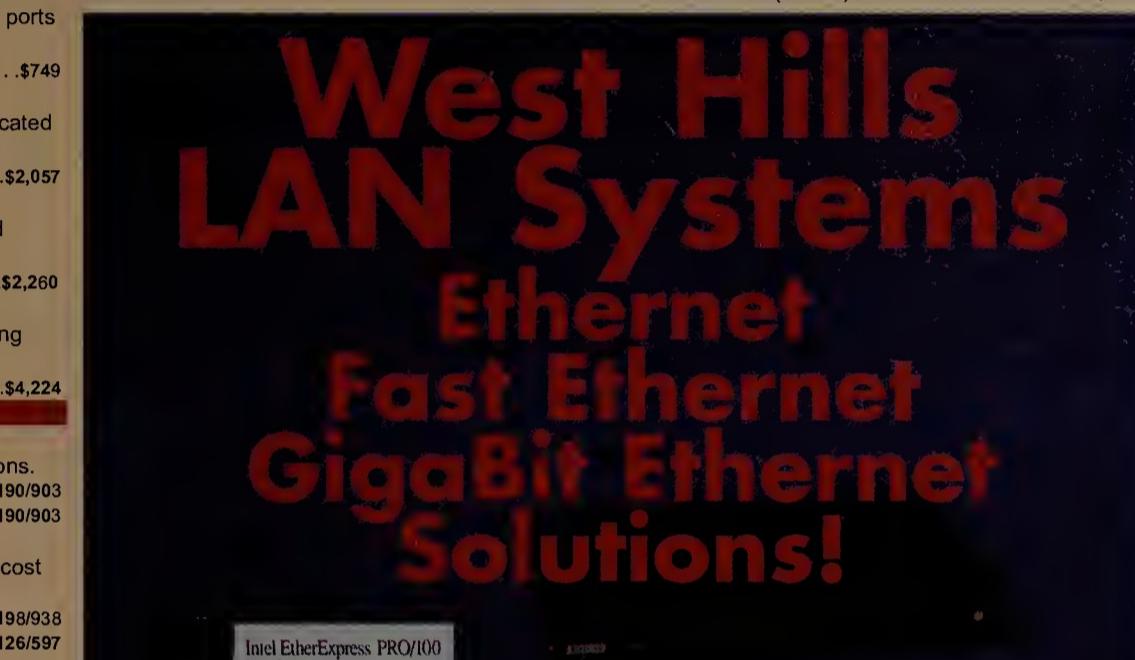
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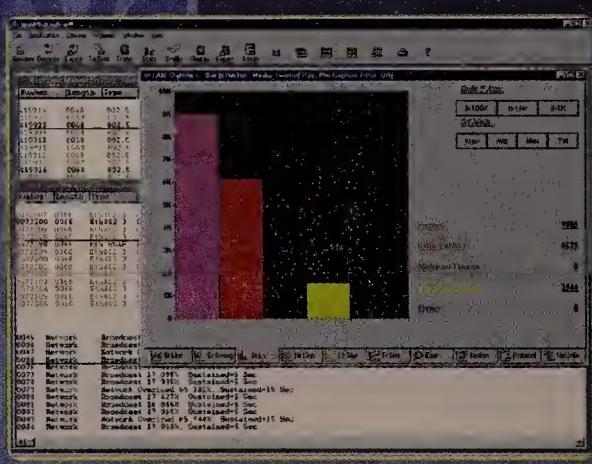
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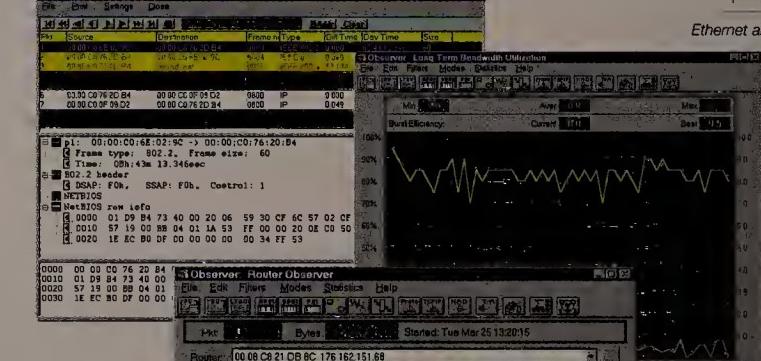
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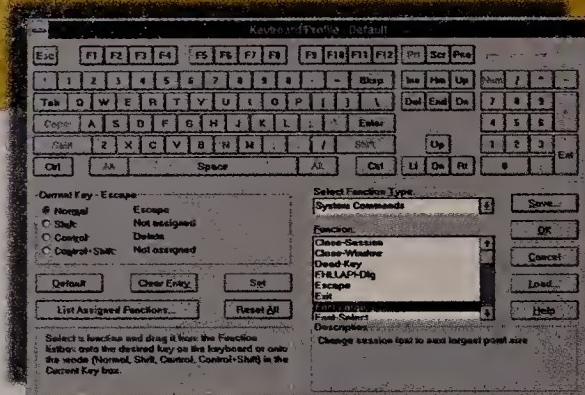
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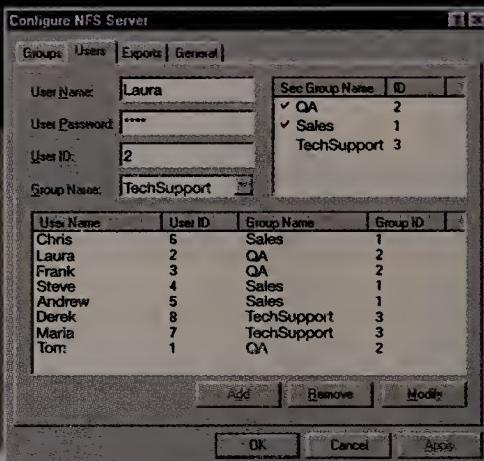
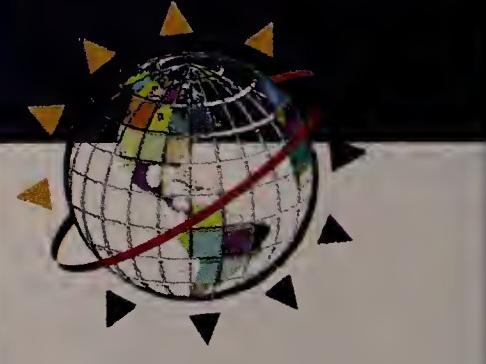
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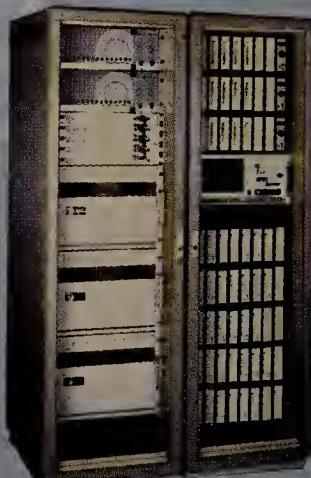
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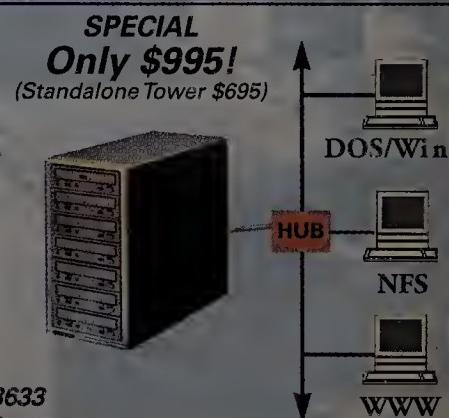
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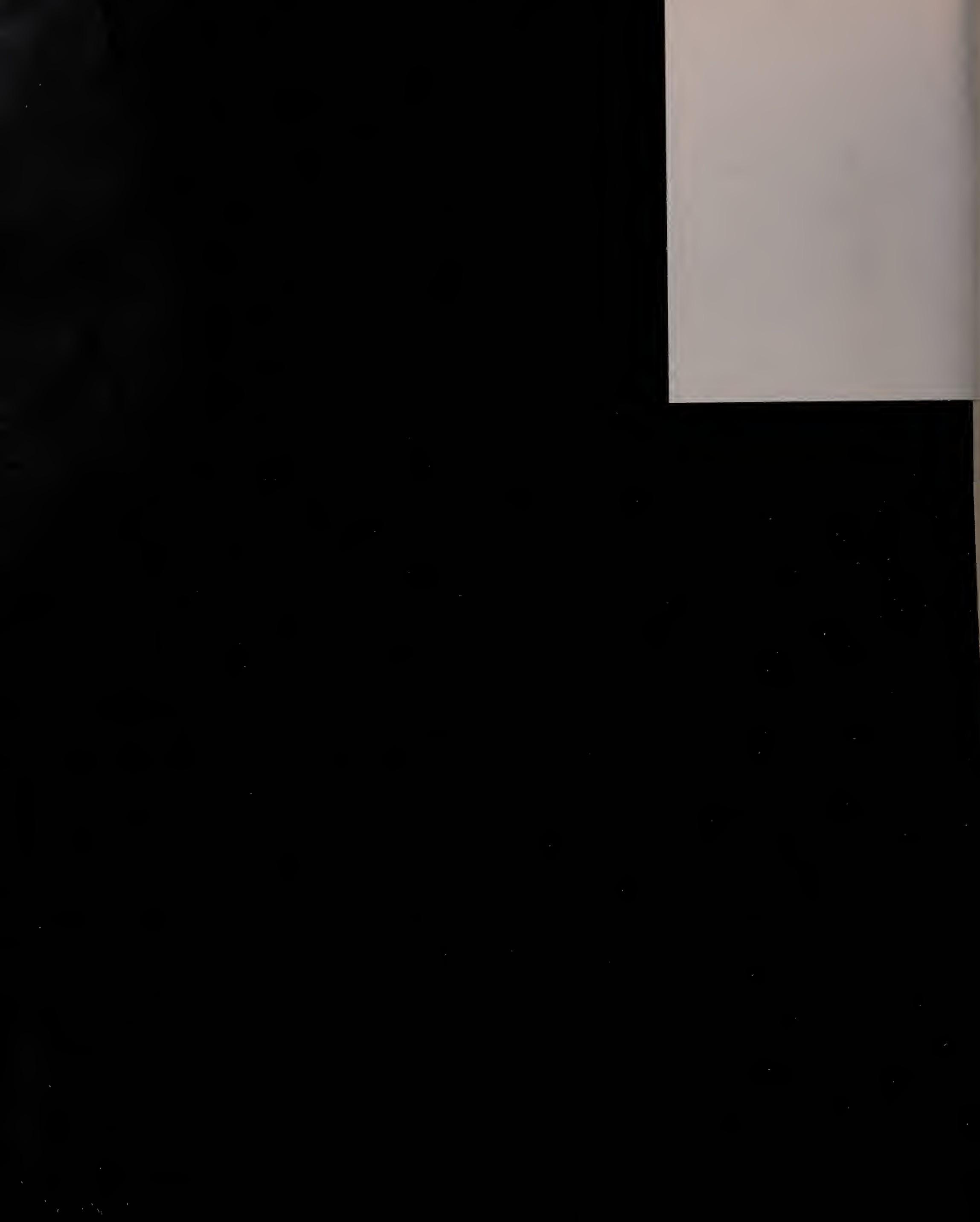
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Gigabit

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This time we chose as our setting Piero's Italian Cuisine & New England Fish Market, a favorite spot among Las Vegas locals, where the conversation jumped from how quickly

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Gigabit Ethernet products have emerged to predictions about whether the upstarts will be acquired and hit certain revenue numbers.

Although the names of the entrepreneurs on our guest list had not changed since the last time, their companies certainly had.

Last we met, not one was delivering products, but all five companies represented had products to show at the recent NetWorld+Interop '97 show here.

Prominet Corp.'s Menachem Abraham is the proud new parent of a 41.G bit/sec Cajun backbone switch, which explains why his ears perked up when our server listed barbecued Cajun shrimp as an appetizer. And Bernard Daines of Packet Engines, Inc. said his company's 1G bit/sec Ethernet adapter card is already generating revenue.

Not to be outdone, Bobby Johnson's Foundry Networks, Inc. introduced FastIron switches and NetIron switch routers that boast quality of service (QoS) capabilities, while Joe Kennedy's Rapid City Communications rolled out its FIRST family of devices that can switch or route more than 7 million IP packets per second. In addition, Gordon Stitt's Extreme Networks, Inc. introduced a line of Summit switches — complete with purple paint jobs — that provide wire-speed switching and routing, along with policy-based QoS.

The products are big news, but the even bigger story is that the companies have completed successful interoperability testing with their prestandard gear. "In the last couple of months, this market has really come together," Abraham said. "It's been relatively easy. We just hooked up our products and they all worked together."

"We're barely a year into it, and more than 20 companies are interconnecting in the [Gigabit Ethernet Alliance] booth. That's a phenomenal accomplishment," added Stitt, who selected two bottles of a 1995 Pinot Noir called Acacia, the same name as a Gigabit Ethernet vendor not on the guest list.

The conversation was fast-paced throughout the night, though it was stopped cold at one point when someone in the room next door uttered the words "overloaded routers." That term brought a smile to each CEO's face.

Aside from patting themselves on the backs for their new

products, our guests also shared fresh financial information. All of the start-ups — except Foundry — bragged that they are on their second round of funding. The companies combined pulled in about \$44.5 million in second-round venture funding, adding to the more than \$30 million raised in initial rounds.

A less formal method of measuring how far these vendors have come was the shift in dinner attire. Three out of the five men shamelessly donned the latest in "vendor wear." Johnson and Stitt sported polo shirts adorned with their respective company logos (Stitt's was complete with Extreme's URL across the back), while Daines wore a canary-yellow

nard's list of vendors doing internal development is necessarily gospel," Kennedy said. "I'd be surprised if there weren't acquisitions out of the Big Four, and I'd be very surprised if all five of us are still here in six months."

The members of our party also challenged each other to hit high first-year revenue marks. They agreed that any vendor that reaches the goal of \$24 million — the same number hit by LAN switch maker Xylan Corp. in its maiden year — will help foot the bill for our next Gigabit Ethernet dinner. That's an offer we gladly went along with since *Network World* funded this and the previous feast.

And Gigabit Ethernet prices are sure to drop. Daines predicted that in one year, pricing for a Layer 2 Gigabit Ethernet switch will be about \$1,500 per port, while a buffered repeater like the one his company offers will cost about \$500 per port.

"Cost per port for Gigabit Ethernet will be important at the end of the day," Daines said. The rest of the group, however, downplayed the significance of Gigabit Ethernet repeaters after Daines made an early exit.

Also, they noted that price isn't the only factor that will drive Gigabit Ethernet demand.

"There is a move into Layer 3 switching and wire-speed routing that is having a big impact

"The fact that so many vendors are participating in the Gigabit Ethernet Alliance demo shows users that we've made progress."

Gordon Stitt, Extreme Networks

"ATM revenues, if not dented, are at least on hold because of Gigabit Ethernet."

Bobby Johnson, Foundry Networks

"Customers have been bullied into thinking they should care about QoS."

Bernard Daines, Packet Engines

"People are really starting to rethink ATM."

Joe Kennedy, Rapid City Communications

"Xylan did about \$24 million its first year. The question is: Are we going to do better?"

Menachem Abraham, Prominet

Customers will come

Of course, revenue means customers, so we asked our guests how many users they figure will actually deploy Gigabit Ethernet gear in coming months.

"All of us will have substantially north of 50 customers [by October]," Johnson said, raising his voice over Frank Sinatra's version of "It Had to Be You," which was piped into our room. "We've only had a sales force onboard for a month, and already we have 40 requests for beta."

In fact, the entire table seemed confident that customers would choose their products over ATM switches.

"ATM running at 622M bit/sec costs about \$10,000 per port," Abraham said. "And here we are with 1G bit/sec Ethernet selling for about \$2,500 per port." Actually, FORE Systems, Inc.'s 622M bit/sec ATM port pricing ranges from \$3,000 to \$9,000, depending on configuration, but that's still higher than Gigabit Ethernet.

on network infrastructure, and ATM introduces more complexity [than Gigabit Ethernet]," Stitt said. "The ATM guys have always used QoS as a stick against us, but that's a lot of baloney now that start-ups have introduced those capabilities [on non-ATM products]."

With the first big wave of Gigabit Ethernet switches due out this summer, it won't take long to get a read on just how successful the new market — which has been projected by Menlo Park, Calif.-based consultancy Dell-Oro Group to reach \$980 million in worldwide revenue by the year 2000 — will become.

And so the group will reconvene at the fall NetWorld+Interop show in Atlanta to recap the year.

The question then will be: Who's picking up the check?

News Director Bob Brown contributed to this story.

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Search

Continued from page 1

engines and following every possible link — Middleberg sometimes recommends the company retain another firm to do less intensive follow-up searches. Datalytics, for instance, offers a service called Markwatch for \$895 a year, or \$425 for a quick and dirty search.

To be fair, Datalytics does more than plug keywords into AltaVista and Lycos — though it uses those search engines as a starting point. Datalytics also checks the WHOIS database of

domain names, a massive Usenet feed and some frequently updated news sites.

Then, it further refines the search by using automated tools to check whether the Web sites are still active and, if so, excerpts portions related to the key terms. Datalytics employees also have learned to program the searches to ignore HTML coding in hypertext links, resumes and other distractions.

"We throw out things our customers are not looking for," said Todd Leonard, a Datalytics software engineer.

After the initial search, Data-

lytics often sets the program to automatically search for new entries or changes once a week and make the results available online.

Specifically, Datalytics is targeting legal departments — urging them to use the service to help spot possible trademark infringement. Customers include Gateway 2000, Inc. and J.P. Morgan & Company, Inc.

"The problem you have in running search engines is that you don't know what's changed," said Oliver Herzfeld of J.P. Morgan. Some other companies have had to hire full-time

paralegals to keep up, he said.

But some off-the-shelf programs already do much of the job.

Quarterdeck Corp.'s WebCompass, for instance, automatically plows through 35 search engines and can be programmed to look for more. WebCompass also checks links to see if they are still active, tosses out duplicates and churns out a dense summary of each Web site. The software, which costs \$50, can even perform automatic follow-ups.

Jay Nelson, product development manager, said the program

would be ideal for public relations, marketing and legal departments. In fact, he said, Quarterdeck already uses it for its electronic clipping service.

But Nelson thinks that many firms will probably continue to hire outside firms. "When it comes to [trademark] infringement, you want to be thorough," Nelson said. "And you would kind of like to know that. . . if someone screws up, you could sue them."

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NT

Continued from page 1

ceal the data — a paltry 16-bit encryption — is far below safe industry standards.

Experts also say security data replicated to remote NT servers — referred to as backup domain controllers — is wide-open to attack if the servers are not physically secured.

Microsoft's Service Pack 3 includes patches for security breaches uncovered by hackers in the past two months, such as the RedButton Bug and the Out-of-Band attack. The latter was brought to Microsoft's attention on May 9. This system-crashing bug is activated when a hacker sends a TCP/IP command with Out-of-Band data to an NT server port connected to the 'Net.

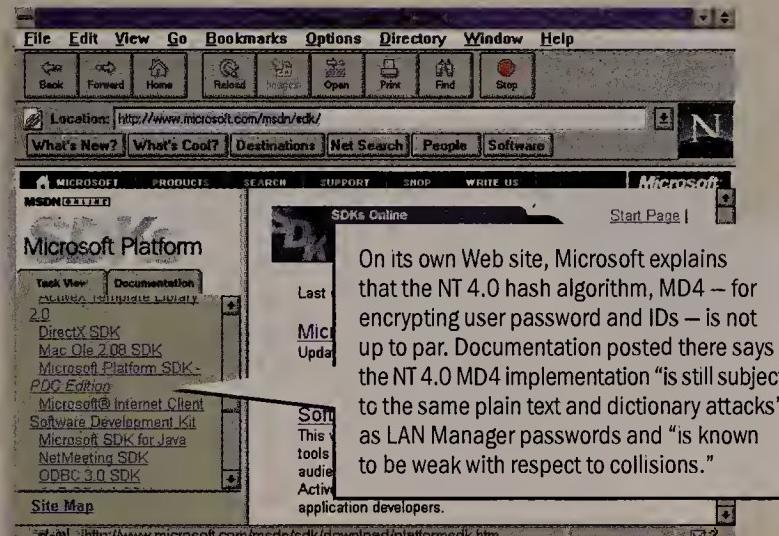
One shortcoming of the NT 4.0 security scheme is that Microsoft keeps a tight leash on NT source code. Unix, meanwhile, has always been prone to hackers, but source code allowed users to probe for possible holes.

"We're relying more and more on commercial products, and we don't know what's in them," said Robert Ayers, the Department of Defense's chief of the Information Warfare Division, deputy directorate for operations. He said the Defense Department is upgrading to Windows NT and has unsuccessfully tried to get NT source code to conduct a risk analysis.

One of the big unanswered questions is why Microsoft elected to ship NT 4.0 with a weak authentication mechanism. In 1995, cryptography experts demonstrated how the NT 4.0 hash algorithm, MD4, could not be counted on to deliver proof of data integrity. A hashing algorithm is a mathematical technique to check for message integrity. NT systems employ MD4 to protect passwords and other user authentication information held in their security databases known as the security account manager (SAM).

"[MD4] shouldn't be used," said Jim Bidzos, president of RSA Data Security, Inc. RSA should

NT'S WEAK LINK?



know — it developed MD4.

Microsoft officials deny that NT 4.0 systems are vulnerable to attack based on MD4. The hash algorithm has been a part of the company's network strategy since 1988 when Microsoft developed NT's net operating system predecessor, LAN Manager.

Enzo Schiano, group product manager for NT, said no customer has filed an incident

report pinpointing MD4 as a weak link. He said a hacker would need administrator-level rights to access the SAM database and then do all of the computation necessary to crack the MD4 hashing algorithm.

"It is next to impossible. It is a nonissue," Schiano said.

Microsoft will replace MD4 with the Secure Hash Algorithm or another RSA hash algorithm, MD5, in NT 5.0 next year. This change will be part of a security overhaul employing Kerberos-based authentication processes.

But there is growing concern that MD5 will soon fall, too, according to Bart Preneel, director of the International Association

for Cryptologic Research in Leuven, Belgium. Engineers from the German equivalent of the National Security Agency have demonstrated weaknesses in MD5, Preneel said.

RSA scientist Ron Rivest, inventor of MD4 and MD5, acknowledged the validity of the European research.

NT also is weak in another area, the cryptography used to conceal the password data. NT 4.0 uses extremely weak 16-bit encryption. "Forty-bit is easy to crack, so 16-bit is very easy," said William Hampton, vice president of Cary, N.C.-based consultancy, Carsten Hampton, Inc. He said it is unknown why Microsoft decided to use such old, weak security technology in NT.

Schiano argued NT's two-tier approach of first applying MD4 hashing, with 16-bit encryption on top offers adequate password protection. But should customers want to beef up NT encryption, they could employ a new optional feature introduced with Service Pack 3, which adds a third layer of 128-bit encryption. "It will take a server farm of Cray Research, Inc. supercomputers to break that combination," Schiano said.

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Microsoft issues service pack around security

In addition to plugging several NT security holes, Microsoft Corp. last week delivered its NT 4.0 Service Pack 3 (SP3) with features that address database connectivity, application integrity and support for 3-D programs.

SP3, available from Microsoft's Web site (www.microsoft.com), includes the latest version of Microsoft's Open Database Connectivity (ODBC) API. ODBC 3.0 provides improved administration features and more configuration information about ODBC resources installed on networked systems.

The service pack also includes upgraded remote procedure call (RPC) support that can accommodate message queuing.

Message queuing technology, which Microsoft will deliver with the upcoming Microsoft Message Queue Server, ensures that distributed applications could recover should the network

go down.

SP3 contains a complete software implementation of DirectX 3.0 — Microsoft's updated 3-D graphics technology — including better color graphics and improved audio.

Finally, the NT SP3 contains components that add functionality to Microsoft Internet Information Server, including:

- Active Server Pages 1.0b, which allows users to combine HTML, scripts and components to rapidly build Web-based applications.
- Microsoft Index Server 1.1, a software engine providing full-text indexing, and searching of HTML, Microsoft Office and text documents.
- Microsoft NetShow 1.0, the company's server-side software for delivering live and on-demand multimedia content.

— Christine Burns

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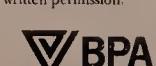
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A million monkeys? Bring in the government

I wrote a few weeks ago about the International Ad Hoc Committee (IAHC) and its somewhat eccentric proposals for new top-level domains (otherwise called gTLDs—generic top-level domains) for the Internet Domain Naming System.

If you read last week's *Network World* front-page story, "Chaos reigns in domains," you'll know we aren't anywhere closer to getting these naming problems resolved.

I must digress here and note that William Schrader, CEO of PSINet, Inc., was quoted in the story as calling for a "global convention to be held in cyberspace" to resolve the issues.

Oh, right, that will really get things resolved quickly. To steal a quip from Robert Wilensky of the University of California: "We've heard that a million monkeys at a million keyboards could produce the *Complete Works of Shakespeare*; now, thanks to the Internet, we know this is not true."

Now, one of the major things that many of the combatants in this melee seem to be worried about is that Uncle Sam might get involved. John Servais, marketing director of Network Access Services, was quoted as

"We've heard a million monkeys at a million keyboards could produce the Complete Works of Shakespeare..."

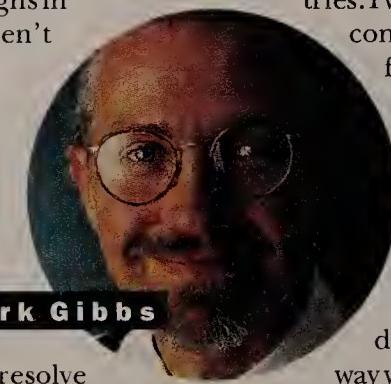
saying that this would be the "death knell of the Internet."

I disagree.

The problem is that the management of the entire naming system was handed to InterNIC years ago with a grant from the National Science Foundation. This was in the days of the Internet being a club for research firms and academics. No one cared much about who got this dirty job.

Now that we have organizations with political and financial stakes tied up with naming services (just consider that InterNIC made more than \$100 million from its services last year), the issues involved are serious.

But underlying all of this infighting is an issue most commentators overlook: How important the Internet is to our culture.



Mark Gibbs

Consider the roads, the railways, the telephone system, radio and television. These systems are regulated industries for a good reason: If they become unworkable, the economy will suffer.

Well, folks, the Internet is no longer an issue for just the computer-related industries. I would suggest it is a national concern that is crucial to the future of our economy. The government *should* be involved.

Now to be realistic, I don't think the government will do a great job. It is almost doomed to fail at one or more levels. But at least it will do the job in the context of the way we make decisions about all of the important aspects of our culture: through the political process.

"Argghhh!" you cry. "That process is flawed and clumsy."

Oh really, and you think the quasi-academic fuddy-duddies who are part of the Internet old guard working in concert with the telcos and other Johnny-come-latelies with vested interests are a better choice?

You really think that their process of reaching consensus is any less political?

And what needs to be addressed at once is the problem of establishing "official" name and directory services.

Those organizations that want to be in either of these businesses as part of the core Internet infrastructure should be required to meet standards and observe practices such that they perform reliably in the public interest.

We can also allow for "nonofficial" naming and directory services to coexist with official services.

This means we can support the kind of free-market diversity we all cherish as one of the most important attributes of today's Internet while simultaneously having infrastructure elements that are managed in the public interest.

I think that if "we"—those of us who care about and believe in the importance of the Internet—drive the government's role, rather than having it forced on us as a punishment for our childish infighting, we would find that government involvement could be made to work more effectively than any other solution.

Implementing democracy in cyberspace. Now there's a thought.

You know where to find me—nwcolumn@gibbs.com or (800) 622-1108, Ext. 504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

YES, WE HAVE OUR PRICE, AND IT'S A FREE BOAT RIDE The launch of a Web site used to be an understated affair. A press release, a few phone calls and maybe some take-out pizza.

Now these events have become elaborate productions, and none more so than the debut last week of the **Forbes Digital Tool** Web site.

The Forbes clan celebrated Digital Tool's launch with a press conference and cruise on New York harbor aboard the Forbes' yacht, the Highlander.

As more than 100 journalists and business executives sailed around Manhattan, one thing became clear—when you have a lot of money, you can make anything you do seem important.

Not that the new Forbes site isn't good. It's split into six editorial sections, each with

one corporate sponsor. Most of the sections deal with various aspects of business and technology, though one department, dubiously titled "Cool," is touted as Forbes' guide to the hip life. (This section, sponsored by Stolichnaya vodka, won't go online until June 12, presumably to give the bow-tied Forbes folks a little extra time to figure out exactly what "cool" is.)

The original version of Forbes' Web site primarily reflected what's in *Forbes* magazine. Digital Media Editor **David Churbuck** says the new site, still at www.forbes.com, will incorporate the existing *Forbes Online*.

Churbuck also said Digital Tool's main competition would be business- and technology-oriented sites such as those from *Upside* and *Red Herring* magazines.

IT'S HELL WHEN YOU CAN'T GET DECENT INTERNET ACCESS Here's a chance to do good by getting online. **Catholic Telecom, Inc. (CTI)** of Hillsdale, N.J., is entering the Internet service provider business. The company announced last week that beginning June 1, it will target its new dial-up Internet services toward the nation's 160 million Christians.

As an added inducement, the company said it will donate all profits to charity. And for customers worried about family members straying from the flock, CyberPatrol software will be available free with Internet accounts.

ISP service for CTI will be handled by **GridNet International**, based in suburban Atlanta. Unlimited Internet access will be offered for \$19.90 per month, a small price to pay for a chance to earn credits toward heaven.

CTI also will offer nationwide and international long-distance service, wireless communications services and calling cards.

LEFTBANK GOES GLOBAL Global Internet.Com, Inc., a network integration services provider in Palo Alto, Calif., has acquired **The LeftBank Operation, Inc.**, a Boston-based firm specializing in electronic commerce systems.

The purchase is the latest in a series of major-market acquisitions by Global Internet, including service operations in Chicago and San Francisco.

Terms of the agreement were not divulged.

THAT'S A QUICK ASCENSION Searching for a new plan toward profitability, search engine start-up **Infoseek Corp.** of Santa Clara, Calif., last week replaced CEO **Robin Johnson** with **Harry Motro**, who was named company president only two weeks earlier.

Motro was formerly an executive at **CNN Interactive**.

Infoseek, like every other major search engine company, has been losing money since its inception in 1995. The company went public last June.

We can't offer you a ride on a champagne-drenched yacht, but if you give Net Buzz your best Internet and intranet news, we know where we can scare up a rowboat and a cooler full of beer. Contact Chris Nerney at (508) 820-7451 or cnerney@nwru.com.

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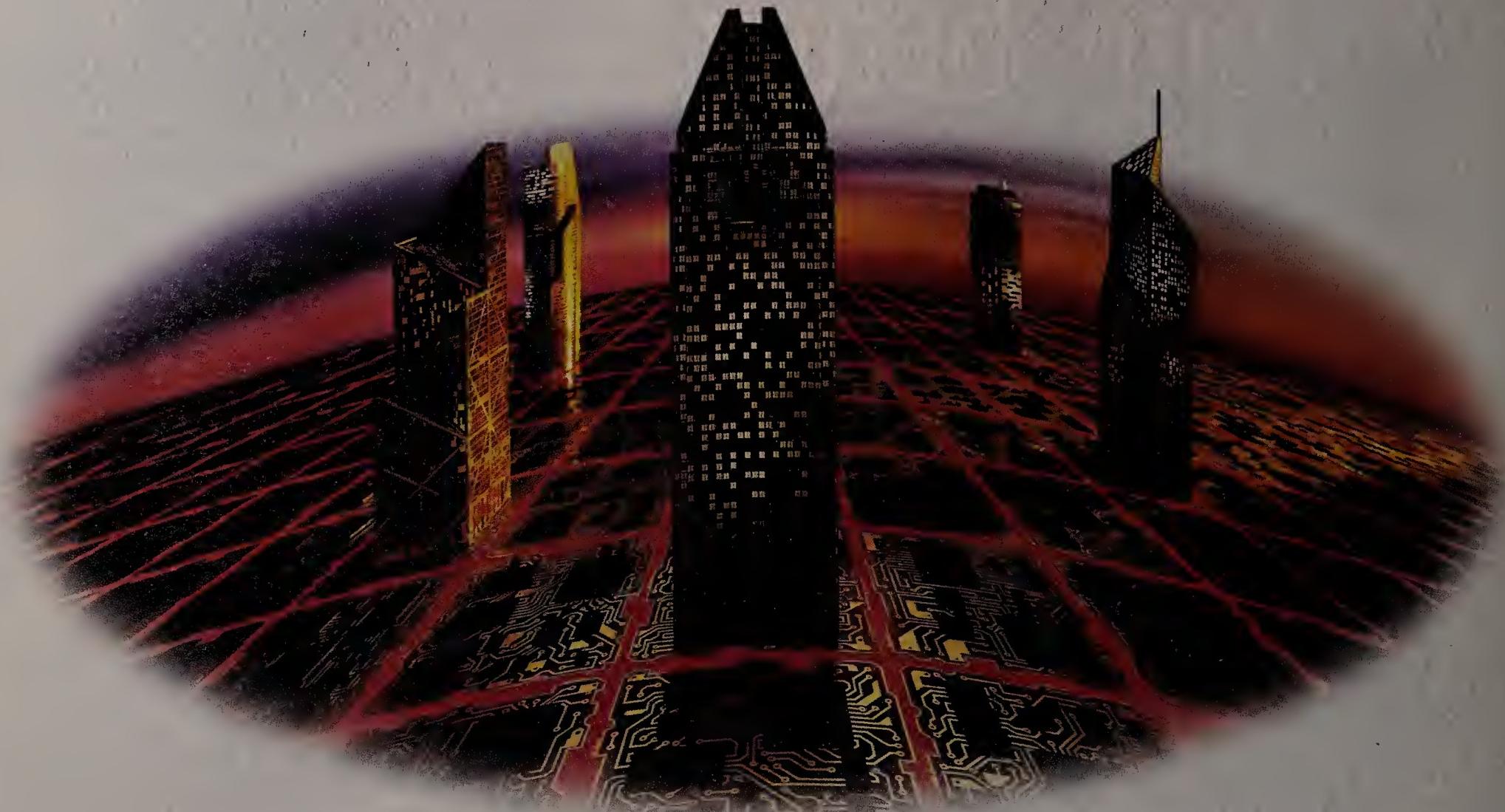
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